

The Iron Age

A Review of the Hardware and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 10 Warren Street, New York.

Vol. XIV: No. 22.

New York, Thursday, November 26, 1874.

Four Dollars a Year.
Single Copies, Ten Cents.

Palmer's Power Spring Hammer.

The accompanying illustration presents a side elevation of Palmer's Power Spring Hammer, invented by Mr. James Palmer, and manufactured by Messrs. S. C. Forsyth & Co., Manchester, New Hampshire. The great advantage claimed for this hammer is that it can be operated by the same power used to run the works, without additional machinery or attendance, and is under such perfect control that it will deliver any weight of blow required. The smallest size will deliver 500 strokes a minute, and is especially adapted to forging cutlery of all descriptions, bowls of spoons, small hardware, jewelry, &c. The medium size is designed for the use of a general forge shop, and will strike 250 blows a minute. The largest forms, it is believed, are as well adapted to all classes of work as the steam hammer, while they are free from the expense attending the use of the latter.

When employed in the manufacture of drop forgings the dies are made in the usual manner, and are keyed in position. The machine is driven by a friction pulley sliding on a splint in the shaft, the belted pulley being loose on the latter. The friction pulley is operated by a forked clutch worked by the right angled levers attached to the long foot lever, which is bent around the fore part of the hammer so as to be accessible on both sides and front of the apparatus. The shaft has a crank forged in the center and carries upon it a connection which extends to a leaved spring. On the other end of the spring is attached the hammer head, in which is keyed the top die. The spring works upon the bearings of a flat rocker shaft, to which it is securely bolted.

The operations are as follows: The iron being heated and placed upon the die, the forger places his foot on the treadle to depress it, thus drawing down the arm that moves the clutch friction into the running loose pulley. The crank is thus revolved, drawing down the spring which carries up the hammer head, and producing by its velocity a vibration of the spring in which the blow given is in proportion to the velocity in which the crank revolves. It is aptly illustrated by cracking a whip. To forge a long rod or scythe, an aperture cast through the body of the upright part so as to allow the work to be passed lengthwise the forging dies is provided. The slightest pressure of the foot on the treadle is easily observable in the working of the machine, but the head never allows the dies to meet until there is velocity enough to produce the requisite vibration of the spring. The balance wheel, on the end of the crank shaft, acts in two capacities, the wheel having a balance placed within its rim to counteract the weight of hammer head, thus allowing the hammer to stop in any position in which the friction may leave it, thereby preventing the weight of the hammer head from always resting on the lower die when stopped; and the momentum of the wheel keeps the machine perfectly steady when running, and prevents, by the balance within its rim, that oscillating movement of frame which would be the result of the blow if not thus balanced.

There are, we learn, a considerable number of these hammers now in operation in various parts of the country, doing all classes of forging, from the smallest forks upward.

Directions for the Use of Nitro-Glycerine in Rock Excavations.

The following letter from Col. G. H. Ellers, C. E., on the use of nitro-glycerine, will be of interest to those engaged in iron mining:

MY DEAR SIR: I have the honor to acknowledge the receipt of your communication of the 21st instant, and in response thereto, beg leave to say that in such material as you describe, cemented or indurated earth, hard pan, etc., etc., the use of nitro-glycerine will scarcely be found as economical as powder. In the older rocks, granite, gneiss, limestone, quartz, etc., nitro-glycerine will do the work at fully half the cost as compared with the best blasting powder. There are many different qualities of nitro-glycerine, varying fully fifty per cent. in power and purity, and, while the pure article is perfectly safe, and does not readily change in store or magazine, the spontaneous explosion of an impure article is merely a question of time and temperature. There are many circumstances controlling the use of this most valuable explosive agent, a proper knowledge of which will often save both time and money; for instance, a diffusion of ten per cent. of water will diminish its blasting power thirty per cent., while an increased power of fully thirty per cent. is obtained by charging directly in the drill hole over what is evolved, when the metallic shell of the cartridge and a stratum of air and water are interposed between the gases of explosion and the rock acted upon. I am unable to say how much loose earth a given charge will move or throw down, never having used it in anything but rock and large erratic

boulders, and I know of no one from whom such information can be obtained. As I have already said, the maximum useful effect of nitro-glycerine, as a blasting agent, is reached in the older and harder rocks; in loose material it is not so effective. The following are substantially Mr. Mowbray's instructions for use and handling, and he probably knows more about the subject than any man in America:

1. Handle with the greatest care, avoiding every possible jar or concussion, and be very careful, if any is spilled outside the can, to avoid striking it with or against any hard substance.

2. When in a solid state, thaw out by placing the cans in a vessel of warm water, never warmer than the wrist can bear, first pouring some of the warm water from the vessel into the can, and always removing the can or cans before adding more warm water to that in the vessel in which the cans are placed.

3. When filling cartridges hold them carefully over a tray, about 2 x 3, the bottom of which

to orders and compel the adoption of every precaution to prevent accidents or explosions.

12. Never use empty cans for other purposes, transport them to a safe place, and then destroy them by fire, or with a fuse and exploder.

13. Carefully examine the cans from time to time, and notice if any pin holes have been eaten through at the level of the nitro-glycerine therein. Should the presence of such holes be detected, procure new cans or stone jars, and place the contents of the unsound cans therein, never trusting your hold on the upper portion of the unsound cans, lest it break loose and trouble ensue.

14. When congealed, nitro-glycerine is absolutely safe; if possible, therefore, it should always be stored surrounded with ice, since explosion is impossible when in a solid state.

The present price is about \$1.65 per pound delivered—the electric exploders are about 30c. for 10 feet wires, and 25c. for 8 feet wires.

Some changes in these figures may be made about the first of next month. If you have any

mirable for their several purposes. There is one elevator, however, the most rapid in action of any other, and which, so far as we are informed, has not yet been adopted in buildings in the United States, if, indeed, it is used in other localities. We refer to what is known by the very indefinite name of "man engine," and which is in use in some of the deepest mines in Europe. It consists of a strong, movable platform, to be made light and ornamental if desired, properly guarded, for each story to be ascended, which platforms are hung by strong wire ropes, or iron chains, from a large drum immediately under the main roof, or in a square tower, over an offset appropriated to such elevator. By a continual oscillation of this drum, for a distance equal to the height of a story, easily accomplished by a small steam engine, the series of platforms, perhaps eight or ten in number, and descending to the lowest cellars, rise and fall always one story with perfect regularity, and needs no attendant or check wires. The

of them in such places is generally of the rudest and most unguarded description. The chief advantage is, being always at hand for use and in action; in fact, the ascension or descent is made as by a series of gigantic strides, through the aid of steam-power. Hotels adopting this system would, we believe, reap profit from it in the several ways already mentioned. The machines, also, are not expensive in construction, and there is no patent right upon them.

The Calumet and Hecla Mines.

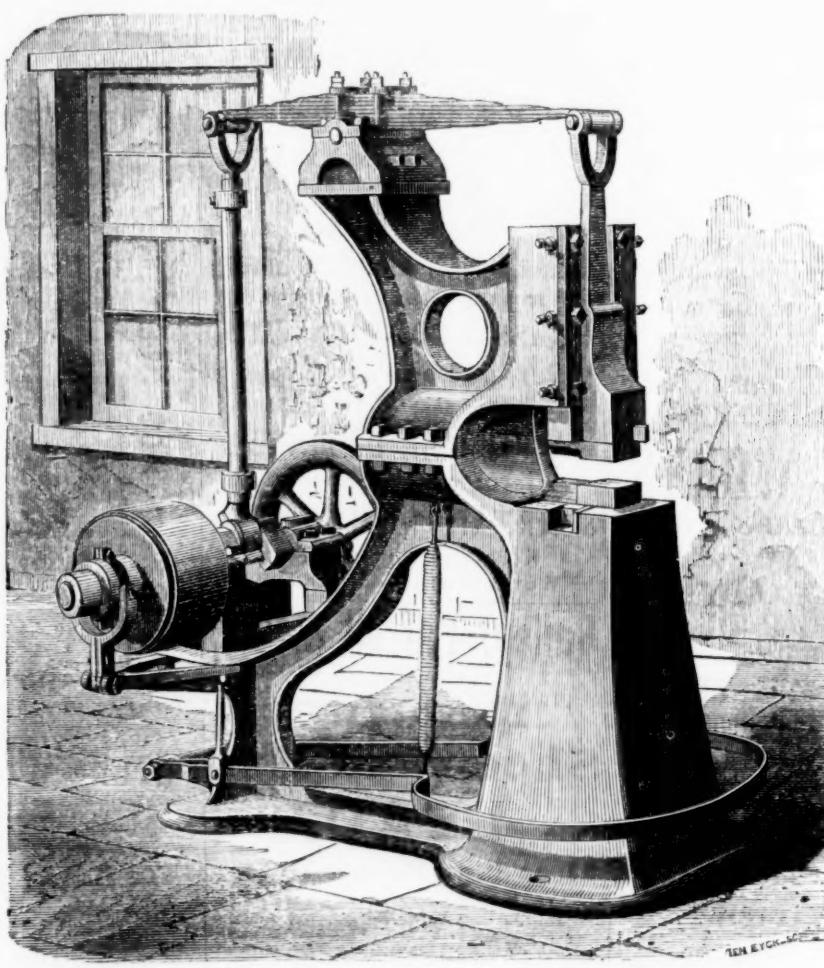
The Northwestern Mining Journal enters upon an analysis of the business and finances of the Calumet and Hecla Mining Company, from which we take the following:

Although the sales for the year were made at an average of 26.40 cents per pound, the actual price for the financial year of the company, ending May 1, 1874, averaged but 22.63 cents, as 8,870,281 pounds were on hand at that date, and valued at only 18 cents per pound at the time of making the financial statement at the annual meeting in August. With these necessary explanations the following figures are presented to show the cost per pound of copper marketed, that is, including every expense to which the company is liable in conducting its business.

| | |
|--|----------------|
| Total sales for year, May 1, '73, to May 1, 1874. 18,392,028 lbs. | |
| Copper on hand May 1, 1873.... 7,507,255 " | |
| Sales from the year's product 16,881,773 at 26.40 cts. \$2,873,032.07 | |
| Copper on hand May 1, 1874.... 8,870,281 lbs. at 18c. 1,596,650.58 | |
| Total product in ingot, May 1, 1873 to May 1, 1874.... 19,755,054 lbs. 22.63c. \$4,469,702.65 | |
| Surplus on hand May 1, 1873.... 1,866,507.34 | |
| | \$6,336,309.99 |
| Surplus on hand May 1, 1874.... \$2,253,545.13 | |
| Paid in dividends during the year, \$30 per share on 80,000 shares..... 1,600,000.00 | |
| | 3,853,545.13 |
| Cost of producing copper for the year, say 19,755,054 lbs. at 12.57 cts. per lb. marketed..... | \$2,482,664.86 |
| The earnings for the year were..... | \$4,469,702.65 |
| Total expenses for the year..... | 2,482,664.86 |
| Net earnings of the mine..... | \$1,987,037.79 |

It will be seen that the copper actually sold within the year, from May 1, 1873, to May 1, 1874, falls considerably short of the precise product of the mine for that period; but another season the figures might be reversed in consequence of the amount on hand varying largely, the difference being 1,363,026 pounds in the two periods above given. Our calculations are based on figures given out officially by the company, and although the result is arrived at by a different process from what it would be with a report as ordinarily made by a mining company, we are confident that we are substantially correct, and do not believe any official showing can increase the cost of production, while a fair exhibit might even reduce it slightly. The figures given prove that the copper was marketed last year at 12.57 cents per pound, and there certainly is no good reason why it should cost any more this season, with a prospect that a little reduction may be made even on this low figure. This is at least five cents per pound lower than the average price at which any other mine has yet been able to market copper; this advantage alone being equal to a net profit of \$1,000,000 per annum. And herein lies the secret of the company's great success; the unusual richness of the copper bearing rock, and the facility for mining the immense quantity of more than 1000 tons of mineral per month on an average, thus securing the production of ingot copper at a minimum price heretofore unknown in Lake Superior mining.

The question may be asked why the net profit is not 13.83 cents per pound if the average price obtained was 26.40 cents and the cost only 12.57 cents. In order to make this clearly understood beyond question, we here recapitulate some of the figures above given. The fact is, the product of 1873 was not marketed at that figure, only 10,881,773 pounds, as above shown; while the balance, 8,870,281 pounds, was on hand at the close of the fiscal year (April 30, 1874), and valued at 18 cents, consequently the average price for the year's product was only 22.63 cents, provided the amount on hand should be marketed no better than 18 cents. The "amount on hand" May 1, 1873 (7,507,255 lbs.), was then valued at 27 cents per pound, and afterward sold at 26.40 cents, showing a loss on the estimate of only six-tenths of one cent per pound. On this year's balance the promise is a gain; in fact, some of the copper, we understand, had been actually sold at an advance on the estimated value previous to the annual meeting, and the recent improvement in ingot assures a further profit on the portion unsold.



PALMER'S POWER SPRING HAMMER.

must be thoroughly covered with "plaster of Paris," which latter must be replaced as rapidly as lightly saturated with the nitro-glycerine. (Memo., plaster of Paris saturated with nitro-glycerine does not readily explode.)

If necessary to store glycerine in a liquid state for any length of time, insert the cork loosely, and pour a pint of cold water in each can, which water must be frequently and carefully poured off and replaced with fresh cold water in warm weather, always taking care to retain the bladder under the cork. If ice can be procured, however, it is both safer and more desirable to congeal the nitro-glycerine and keep it in the solid state.

5. Use gutta percha funnels for filling water holes—never tamp the drill holes, it is totally unnecessary and is pretty sure to kill the individual who does it.

6. Never use hot irons to warm the water, or for soldering the cans, both are sure to cause explosion.

7. Never sledge or drill in a hole or seam where nitro-glycerine has been spilled, without first firing an exploder to clean the place out.

8. Never pour nitro-glycerine into a hole, unless perfectly sure that the hole is sound and will hold water; if otherwise, always use a cartridge.

9. To obtain the best results, use drill holes always six feet in depth, or over, fire with powerful exploders and well insulated wire, by electric battery and with simultaneous explosion.

10. After a blast, look carefully for any unexploded cartridges that may be laying around loose.

11. Allow none but the most careful, competent and sober persons to handle or have charge of nitro-glycerine, and enforce a rigid obedience

important work on hand requiring the use of nitro-glycerine, or of a difficult or dangerous character, I shall be most happy to undertake it at any time.

Trusting the foregoing may meet your requirements, I am, etc., very cordially yours.

(Signed) G. HOWARD ELLERS,
Chief Engineer.

Troy and West Troy Bridge Co.,
Chief Engineer's Office, Troy, N. Y., May
25, 1874.

Elevators.

The American Exchange and Review says: The great elevation of modern hotels, and the natural desire of their proprietors to make the upper stories profitable, lend much importance to the subject of rapid access to those higher regions. Every year increases the number of families that, disgusted with the troubles of house keeping, seek refuge in suites of rooms at hotels. This still drives higher and higher that respectable class of boarders called bachelors, also rising young men, and such casual travelers as are deficient of certain influence or importance. If a quick mode of access to the highest stories could be devised, the latter would become as profitable, or nearly so, as the lower portions, which now is far from being the fact. The present style of box or room elevator in use at the best hotels is good, except in being too slow in motion, and we would not advocate its use, because, for ladies and children especially, it is a great advantage; but we hope to see the rate of speed increased without injury to safety. Beside this kind, there are now constructed open elevators, recently greatly improved in form and speed, and ad-

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In the accompanying drawings, Figure 1 is a

vertical longitudinal section of an improved

puddling furnace illustrating this invention.

Fig. 2 is a horizontal section on the line 3-3.

The walls and other parts of this furnace not

hereinafter specified may be of any common or

preferred construction.

Hydrocarbon gas or oil from any source, and

in such manner as may be necessary or preferred,

is conducted by a pipe, 3, to a burner, B, in what is termed the front end of the

furnace. The burner B is constructed with a

large circular head, a, having cylindrical walls,

which are perforated for the escape of the

gas or oil, the same being so arranged

as to properly distribute the flame. A

register slide or valve, r, perforated correspondingly

with the burner proper, regulates the dis-

charge of gas or oil, and is operated by means

of a handle rod, q, extending out through the

front of the furnace, and attached to an arm,

p, of the valve. A lug, o, prevents any dis-

placement of the valve. The front of the

furnace is provided with a grating, n, for the ad-

mission of air to support combustion. A slide,

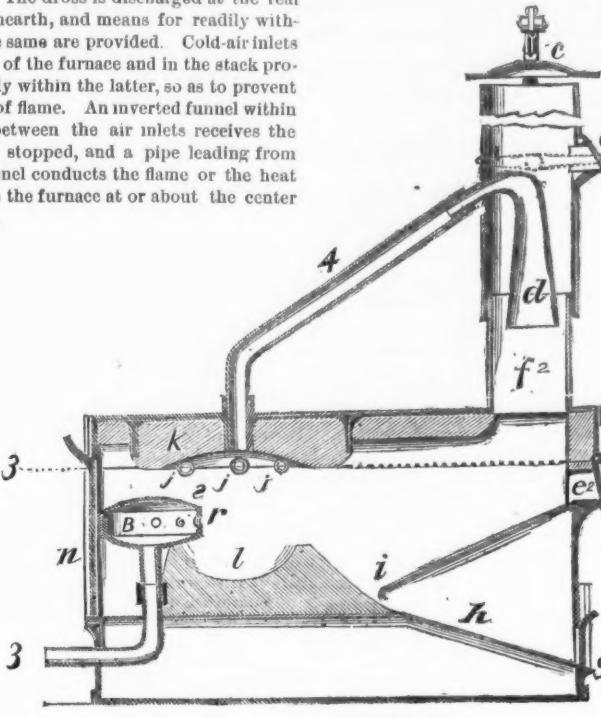
m, covers more or less of this grating, as re-

New Patents.

We take from the records of the Patent Office
at Washington the following specifications of
certain patents lately issued, which will be
found interesting:

IMPROVEMENT IN GAS FURNACES FOR MANU-

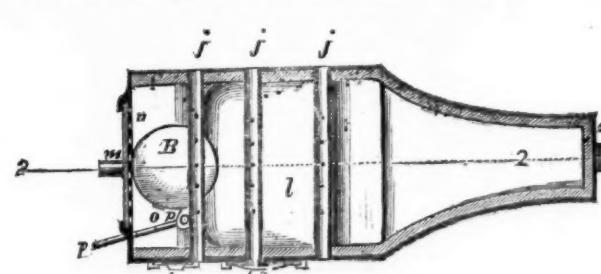
FACTURING IRON AND STEEL.

Specification forming part of Letters Patent
No. 155,577, dated October 6, 1874, issued to
William S. Gillen, of Pittsburgh.This invention relates primarily to the economic
use of hydrocarbon oil or gas as fuel in
metallurgical furnaces. It relates further to
means for applying the flame and preventing
wasteful escape, and for facilitating the separation
and discharge of dross, as hereinabove set forth.The invention is embodied in a simple pudd-
ling furnace of peculiar construction.The gas or oil is fed to a burner of peculiar
construction, the discharge being regulated by
means of a register-slide or valve. The supply
of air to support combustion is regulated in asimilar manner. The arch of the furnace is
longitudinal instead of transverse, and air is
admitted beneath the arch through perforated
pipes, so as to throw the flame downward upon
the metal. The dross is discharged at the rear
end of the hearth, and means for readily with-
drawing the same are provided. Cold-air inlets
in the wall of the furnace and in the stack pro-
duce an eddy within the latter, so as to prevent
the escape of flame. An inverted funnel within
the stack between the air inlets receives the
flames thus stopped, and a pipe leading from
the said funnel conducts the flame or the heat
thereof into the furnace at or about the center
of the arch.The improved furnace as a whole operates to
economize heat and to facilitate the puddling
operation.The following is claimed as new in this inven-
tion, namely:1. As means for burning hydrocarbon gas or
oil in a metallurgical furnace, the burner B hav-
ing a large circular head, a, with lateral dis-
charge orifices for distributing the gas or oil,

IMPROVED GAS FURNACE FOR IRON AND STEEL.—Fig. 1.

and a circumferential register slide or valve, r,
for regulating the discharge, as set forth.2. The combination, in a puddling furnace,
of a grated or perforated front wall, n, fur-
nished with a slide, m, for regulating the en-
trance of air, and the burner B supplied with
heated gas or oil, arranged with reference to
the hearth, as herein shown and described, for
the purposes set forth.3. A puddling furnace provided with two air
inlets, e e', arranged, respectively, in the stack
and rear wall, an inverted funnel, d, arranged
in the furnace stack between said air inlets, and
a pipe, 4, leading from said funnel through the
stack or near the center of the arch, the same being
combined substantially as herein shown and de-
scribed, to operate in the manner set forth for
arresting the flame within the stack and con-
ducting the unconsumed gases back into the
furnace.

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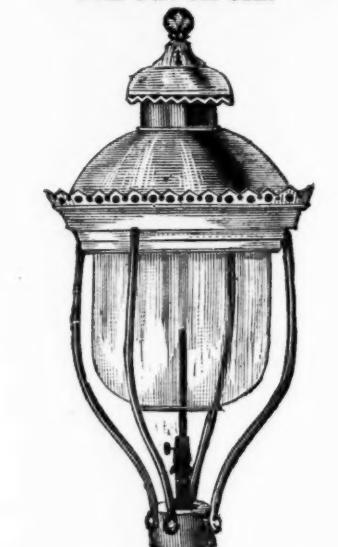
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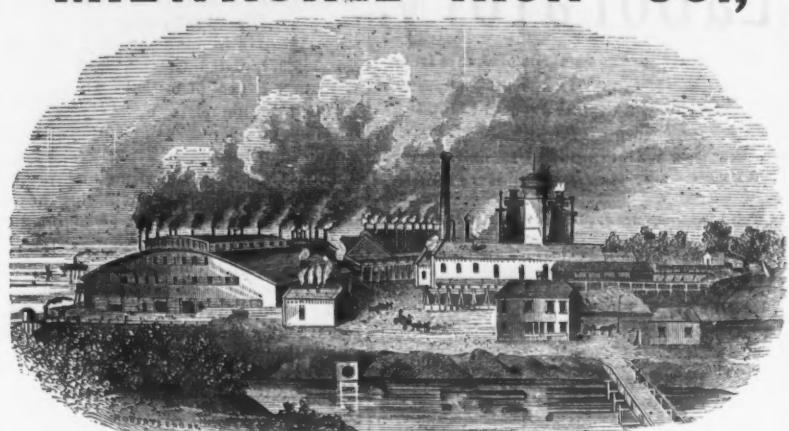
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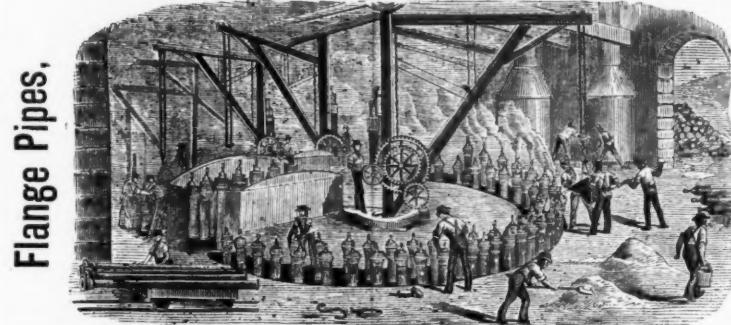
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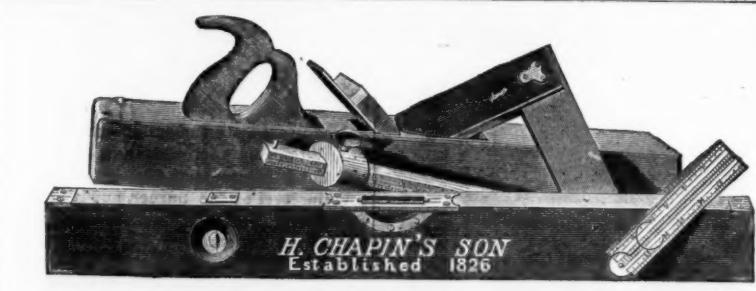
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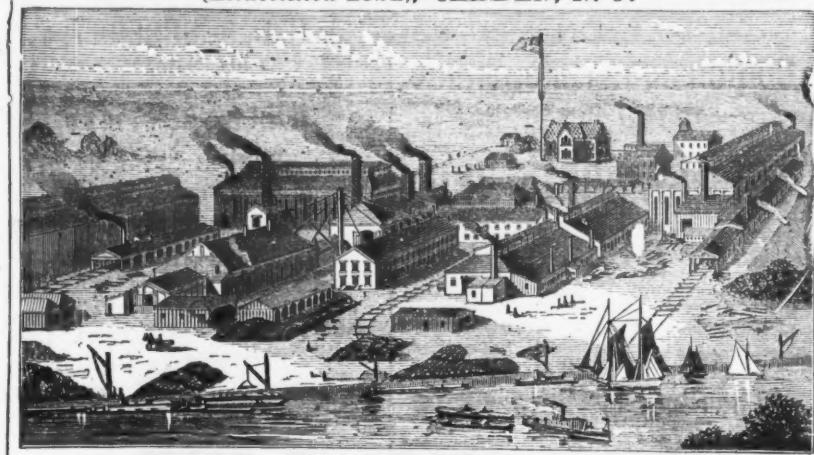
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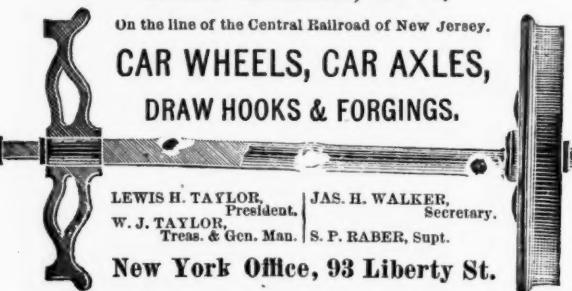
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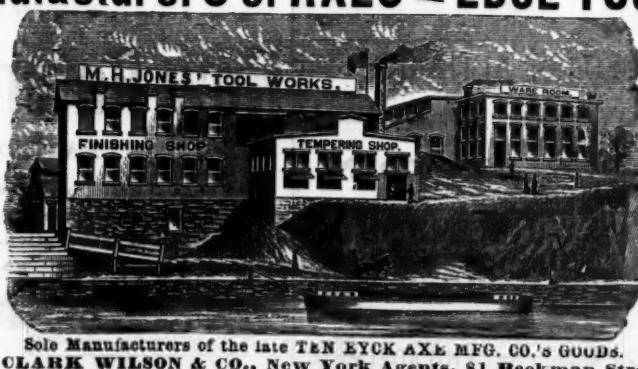
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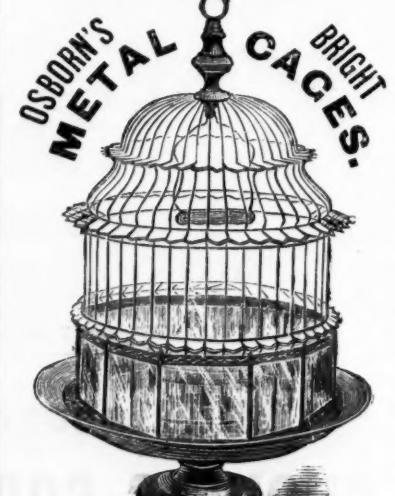
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The Deposition of Metals.

The following items relative to the deposition of various metals upon the surfaces of other metals, are compiled from Byrne's Practical Metal Worker's Assistant. They will be found of interest and value to our readers, as answering many questions which are almost daily asked us by correspondents in various parts of the country:

COATING WITH NICKEL.

Nickel is very easily deposited, and may be prepared for this purpose by dissolving it in nitric acid, then adding cyanide of potassium to precipitate the metal; after which the precipitate is washed and dissolved by the addition of more cyanide of potassium. Or the nitrate solution may be precipitated by carbonate of potash; this should be well washed, and then dissolved in cyanide of potassium; a portion of carbonate of potash will be in the solution, which we have not found to be detrimental. This latter method of preparing the nickel plating solution is simple, and therefore, has our recommendation. The metal is very easily deposited, it yields a color approaching to silver, which is not liable to tarnish on exposure to the air. A coating of this metal would be very useful for covering common work, such as gasolers, and other gas fittings, and even common plate. The great difficulty experienced is to obtain a positive electrode; the metal is very difficult to fuse, and so brittle that we have never been able to obtain either a plate or a sheet of it. Could this difficulty be easily overcome, the application of nickel to the coating of other metals would be extensive, and the property of not being liable to tarnish would make it eminently useful for all general purposes. We coated articles with nickel in 1845, which were exposed to the air for many years without tarnish, and when last seen by the author exhibited no change.

ANTIMONY, ARSENIC, TIN, IRON, LEAD, BISMUTH AND CADMIUM.

We have deposited these metals from their solutions in cyanide of potassium; but not for any useful application.

IRON.

Iron may be very easily deposited from its sulphate: Dissolve a little crystalline sulphate of iron in water, and add a few drops of sulphuric acid to the solution. One pair of Smee's battery may be used to deposit the iron upon copper or brass. The metal in this pure state has a very bright and beautiful silver color.

LEAD.

Lead may be deposited from a solution of an acid salt, such as the acetate, but requires some management or strength of battery; it may also be deposited from its solution in potash or soda.

ALUMINUM AND SILICIUM.

Since the publication of the former edition of this work, new methods have been discovered for obtaining the base or metal of aluminum and silica, or clay and sand, in the metallic state, possessing extraordinary properties. One of the methods successfully adopted, is by fusing in a small crucible some chloride or fluoride of aluminum, and when in fusion, inserting two steel poles in connection with a battery which reduces the salt, giving small globules of the metal aluminum. Attempts have also been made to deposit the metals from their cyanide solution, as coating upon other metals in the usual way. We have not ourselves tried any experiments upon these metals, but we take the following results of experiments from Mr. G. Gore, of Birmingham, who seems to have given the subject a good deal of attention:

"It has long been known to chemists that all kinds of clay, stone and sand, of which the earth is composed, consist of metals combined with oxygen, carbonic acid, sulphuric acid, and other non-metallic elements, forming therewith oxides, carbonates, sulphates, etc.; thus clay is an oxide of aluminum, sand an oxide of silica, limestone a carbonate of calcium; but the separation of the metallic bases from the non-metallic elements with which they are combined has been a matter of so great difficulty that few chemists have put themselves to the trouble of accomplishing it, and those who have done so have made use of the most powerful means and reducing agents, such as large voltaic batteries, potassium, etc., and have then obtained them in a state of alloy or combination with mercury. Sir Humphrey Davy, the discoverer of most of these bases, in his experiments on the decomposition of the alkalies and earths, used a powerful battery, consisting of 500 pairs of plates, and then succeeded in obtaining them combined with mercury, from which they were afterward separated. Wohler and Berzelius, in their discoveries of the means of separating the metals aluminum and silicon from their respective compounds, clay and sand, used a high temperature and potassium, and then succeeded in obtaining them in the condition of dull metallic powders, nearly infusible.

"By a means recently discovered, and described in the March number of the *Philosophical Magazine* for this year, I have succeeded in depositing the metals aluminum from clay, and silicon from sandstone, each in a perfect metallic condition, by dissolving pipe clay, common red sand, powdered stone, etc., in various chemical liquids, and passing currents of electricity from ordinary small voltaic batteries through the solutions.

"My attention has since been directed to produce simple processes, whereby any person not possessing a knowledge of chemistry may readily coat articles with those metals, and thus cause the discovery to be immediately applied to human benefit in the arts and manufactures, and the following are the results of my experiments:

"To coat articles of copper, brass or German silver with aluminum, take equal measures of sulphuric acid and water; or take one measure

each of sulphuric and hydrochloric acids and two measures of water; add to the water a small quantity of pipe clay in the proportion of 5 or 10 grains by weight to every ounce by measure of water (or $\frac{1}{2}$ ounce to the pint); rub the clay with the water until the two are perfectly mixed, then add the acid to the clay solution, and boil the mixture in a covered glass vessel one hour. Allow the liquid to settle; take the clear, supernatant solution while hot and immerse in it an earthen porous cell, containing a mixture of one measure of sulphuric acid and ten measures of water, together with a rod or plate of amalgamated zinc; take a small Smee's battery, of three or four pairs of plates, connected together intensity fashion, and connect its positive pole by a wire, with the negative pole of the battery, and immerse it in the hot clay solution; immediately abundance of gas will be evolved from the whole of the immersed surface of the article, and in a few minutes, if the size of the article is adapted to the quantity of the current of electricity passing through it, a fine white deposit of aluminum will appear all over the surface. It may then be taken out, washed quickly in clean water and wiped dry and polished; but if a thicker coating is required it must be taken out, when the deposit becomes dull in appearance, washed, dried, polished and remmersed; and this must be repeated at intervals, as often as it becomes dull, until the required thickness is obtained. With small articles it is not absolutely necessary, either in this or the following process, that a separate battery be employed, as the article to be coated may be connected by a wire with a piece of zinc in the porous cell, and immersed in the outer liquid, when it will receive a deposit, but more slowly than when a battery is employed.

"To coat articles with silicon take the following proportions: three-quarters of an ounce, by measure, of hydrofluoric acid; $\frac{1}{2}$ ounce of hydrochloric acid; and 40 or 50 grains, either of precipitated silica, or of fine white sand (the former dissolves most freely), and boil the whole together for a few minutes, until no more silica is dissolved. Use this solution exactly in the same manner as the clay solution, and a fine white deposit of metallic silicon will be obtained, provided that the size of the article is adapted to the quantity of the electric current common red sand, or, indeed, any kind of silicon stone, finely powdered, may be used in place of the white sand, and with equal success, if it be previously boiled in hydrochloric acid to remove the red oxide of iron or other impurities.

ANTIMONY.

"Both in depositing aluminum and silicon it is necessary to well saturate the acid with the solid ingredients by boiling, otherwise very little deposit of metal will be obtained."

TIN.

"This is easily deposited from a solution of protocloride of tin. If the two poles or electrodes are kept about two inches apart, a most beautiful phenomenon may be observed. The decomposition of the solution is so rapid that it shoots out from the negative electrode like tentacles or feelers, toward the positive, which it reaches in a few seconds. The space between the poles seems like a mass of crystallized threads, and the electric current passes through them without effecting further decomposition. So tender are these metallic threads that when lifted out of the solution they fall upon the plate like cobweb. Seen through a glass they exhibit a beautiful crystalline structure. If a circular electrode of tin is used, and a small wire put in the center of the chloride solution, the thread-like crystals will shoot out all round, and give quite a metallic confluence. Tin may also be deposited from its solution in caustic potash or soda.

ANTIMONY.

"In the deposition of antimony, Mr. Gore has observed a curious and interesting phenomenon that the metal during its deposition, and after some has been deposited, explodes occasionally, the particles being thrown about by the shock.

(To be Continued.)

Planing of Metals.

A French physicist, M. Tresca, has recently been engaged in an interesting research on this subject. He gives an account of it in a memoir which has appeared in the *Bulletin de la Societe D'Encouragement*. At the close of the paper he formulates his conclusions, which are these:

1. The operation of planing produces, in the prism of matter cut by the tool, characteristic pressures and deformations, which vary according to the form of the tool and the thickness of the prism removed.

2. These circumstances are more easy to define where the case is that of a planing done over the whole breadth of a solid by means of a tool with straight edge, and cutting surface, plane or cylindrical, in which the generating lines are perpendicular to the direction of the movement, and parallel to the surface of the solid planed. With these conditions the shaving detached is a transformation of the original prism, produced by diminution of length, in consequence of a transverse flowing (écoulement) of matter in the direction of the thickness of the shaving, under pressure of the tool.

3. The co-efficient of longitudinal contraction depends on the degree of sharpness of the tool, the facilities it offers for disengagement of the shaving, but, above all, the thickness of the shaving removed. The co-efficient of reduction is smaller for thin shavings, because the flowing in the transverse direction is then rendered easier.

4. The co-efficient of dilatation in the thickness is inversely as the co-efficient of reduction in the length.

5. The co-efficient of reduction varied in the whole series of experiments made, from 0.10 to 0.60, and we possess shavings of steel of more

than a millimetre in thickness, for which it does not exceed 0.25.

6. The surface of separation between the shaving and the block is always smooth, and is modeled on the cutting face of the tool. The opposite face is always striated, and presents the appearance of a series of parallel waves, which are more salient the thicker the shaving. These waves continue to the edge, where we find indications of a flow in width, limited to a very small extent, commencing at these edges. In fine cutting the striae, which are much finer, impart a velvety appearance to the whole surface.

7. A circumference traced on the exterior face before planing, is transformed into an ellipse, in which the relation of the two axes affords the measure of the co-efficient of reduction; but it is best to obtain it by operating with great lengths.

8. When the deformations exceed certain limits the shaving is split at intervals, and there is a disjunction in the directions in which lie the furrows of the waves.

9. When the tool is blunted, the co-efficient of reduction diminishes, and the planing becomes more difficult.

10. The cylindrical form of the tool is very favorable to the operation, and an examination of the deformations leads us to the conclusion that the hyperbolic form is the most recommended.

11. In virtue of the pressure exerted by the cutting face of the tool on that of the shaving, the latter emerges perpendicularly to the surface of the solid, thereupon turning round. Thin shavings become rolled up in the form of a cylinder with spiral base, the winding exactly covering each other. The radius of rolling increases with the thickness.

12. When the generating lines of the cylinder which forms the side of the cutting face of the tool are inclined relatively to the plane of motion, the shaving instead of being rolled up cylindrically, takes the form of the exterior surface of a screw with square thread.

13. The lateral attachment of a conical shaving by one or other of its edges has no sensible influence on the result of the planing. The co-efficient of reduction remains the same, but the edges originally engaged are less round, and are even cut sharply in one part of the thickness of the shaving.

14. When the dimension in thickness becomes comparable to the dimension in width, there is dilatation in both directions, and the shaving takes a quite particular form, of triangular section, which is readily deduced from certain geometrical considerations.

15. The employment of a tool with curved edge gives rise to similar transformations, which are explained in the same way.

16. From the geometrical point of view the formation of shavings may be represented in all its phases by geometrical traces, according to perfectly sure rules. In a first phase, that of driving back (refoulement) the matter not yet detached from the block, acquires, in each of its longitudinal sections, its definitive dimensions in thickness and width. In second phase, that of flowing, the shaving slides on the face of the tool, and acquires its definitive section. In a last phase the shaving escapes, turning round, according as the co-efficients of reduction imposed on its different longitudinal sections, exert on them an influence more or less preponderant.

17. With the rectangular tool, having equal angles, shaving of square section is liberated in the bisector plane of the dihedral figure formed by the two faces removed, giving rise to a deformation more complex, but quite as plausible as that of ordinary shavings.

18. With the tool having a curved edge the effects are of the same order, and bring to light the mode of driving back of a solid brought to the state of fluidity under the action of the exterior pressures to which it is subjected on one of its faces. The gorge-curve, which is produced at the limit of the two first phases of the formation, is quite characteristic, and leaves its impress on the originally free face of the shaving, under the form of curved furrows, which are reproduced identically the same throughout the whole length.

19. In the shavings,

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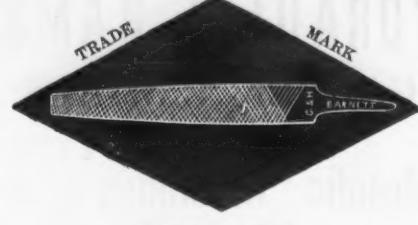
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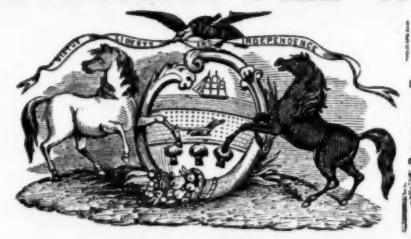
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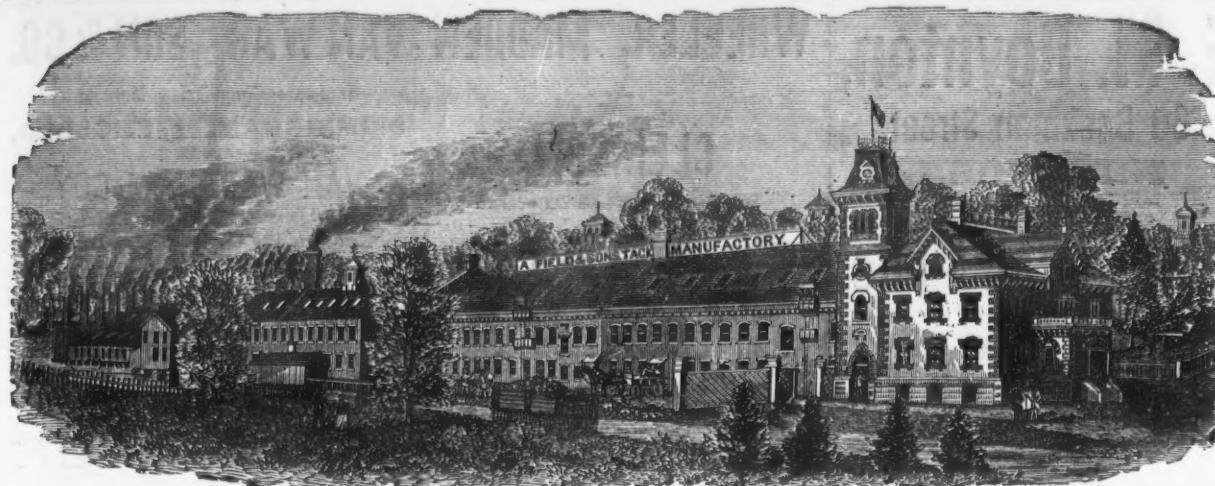
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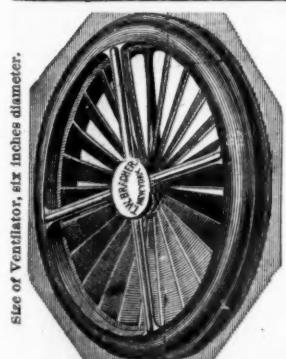


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BUSINESS ITEMS.

NEW YORK.

The Elmira Rolling Mills have secured a contract for rails for the Chippewa Falls and Western Railroad.

NEW JERSEY.

The Wilson Iron Company, of Morris county, just organized, have taken possession of the Splitrock Forge property, and will immediately commence the erection of a furnace known as the "Wilson Patent" for the manufacture of iron in bloom. It is the purpose of the company to also enter upon the manufacture of a different article of iron next spring, if a suitable location can be had in the vicinity of Dover or Rockaway.

The Crane Iron Company has decided to run Jenny Jump and Kishbaugh mines all winter with a full force of hands, but the wages will not be paid until April. The necessities of life are provided from the company's stores on orders.

The factory, machinery, &c., of the former United States Watch Company, of Marion, which has been in bankruptcy, has passed into the hands of the Marion Watch Company, the old organization under a new name. It is said that the works will be immediately put in operation with about 300 employees.

Two hundred men have been discharged from the different shops of Messrs. Starr & Sons Iron Works, in Camden. The works employ 1000 hands when running full force, and there is not over 500 now in the shops.

The Rogers Locomotive Works, Paterson, are engaged in the construction of eight new locomotives for the Hackensack branch of the Erie Railway.

PENNSYLVANIA.

A corporation, composed of influential manufacturers of railway cars of Pennsylvania, has been formed in Philadelphia, for the purpose of constructing cars and leasing them to railroad companies at a rental which, after paying an interest of 8 per cent. upon the cost of the cars, will leave a surplus applicable to the payment of such cost, and by this process the railroad companies leasing gradually become the owners of the cars. The principal support will probably be derived from the Pennsylvania Railroad Company. The name of the association is the "Railway Equipment Trust Company, of Pennsylvania." The capital has been fixed at \$3,000,000, and contracts have been given for the construction of one thousand cars at \$600 per car.

Porter, Bell & Co., recently shipped one of their narrow gauge locomotives to the Peach Bottom Railroad, York. One in Ecuador, South America, runs 35 miles an hour with heavy load on unbalanced track. Porter, Bell & Co.'s narrow gauge freight engines are at work on grades of three hundred feet per mile, pass around curves of one hundred feet radius, and have a speed of over thirty miles per hour.

The Union Forge and Iron Mill, at Pittsburgh, formerly known as the Lower Union Iron Mill, and which has been operated during the past year under the firm-name of Wilson, Leggett & Co., is now running very successfully under the new firm-name of Wilson, Walker & Co., the change having been made on the first of October. These works are engaged chiefly in the manufacture of railroad specialties, of which they are shipping regularly sixty tons per month to one railroad company, and have contracted within the past month to supply several other roads, which orders they are now filling.

They are also manufacturing iron by a new process, a large portion of which is used by Messrs. Kloman, Park & Co. in the manufacture of axes, and by Messrs. Albion & Eckermann for axes.

The Lehigh Iron Company have reduced the pay of their hired officers and clerks an average of 25 per cent.

The Reading Eagle claims to have reliable authority for the statement that the entire working force of the Reading Railroad Company's shops in that city will shortly resume work on full time.

Hussey, Wells & Co., Pittsburgh, are putting in a new sheet train and three heating furnaces, room for them having been made by the abandonment of three melting holes, consequent upon the erection of the Siemens furnaces in the new addition to their building.

All the iron works of Danville are now in operation, for the first time in 18 months.

The forge department of the New Castle Iron Works has been idle for two weeks. When it resumes it will take the name of the Etna Iron and Nail Company.

The machinery of the Co-operative Iron and Steel Company's new rail mill, at Danville, was put in operation a short time ago, and it worked admirably.

Eight hours a day for five days, and no work on Saturday, now constitutes a week's work at the shops of the Pennsylvania Railroad Company, in Harrisburg.

Several new heating furnaces of improved patterns are being erected at the Agricultural Steel Works of A. J. Nellis & Co., Pittsburgh. This improvement will materially increase the capacity of that department of the works in which the process of tempering is carried on.

The Onondaga and the Etna Iron Works, at New Castle, owned and run by a joint stock company, will probably continue operations throughout the entire winter without cessation. The Onondaga mill is now being repaired, and will soon be completed.

The second furnace of the Cambria Iron Company, at Hollidaysburg, will soon be blown in.

The locomotive works of Porter, Bell & Co., at Pittsburgh, are running four days in the week.

OHIO.

Warder, Mitchell & Co., of Springfield, manufacturers of the Champion Mower and Reaper, have been making extensive additions to their

works, and are preparing to erect more buildings at once.

The Marietta Rolling Mill has an order for 200 car loads of railroad iron.

The Grafton Iron Company is running full force and making No. 1 foundry.

A hollow tooth harrow company, with \$10,000 capital, has been formed at Chillicothe.

The Cherry Valley Iron Company, Leetonia, has just finished the repairs on their No. 1 Furnace, and are now at work on new hot blasts. No. 2 is making an extra quality of iron from native ore. Considerable confidence is placed in a report that at a meeting of the directors, about four weeks ago, they decided to start the remaining furnace and the rolling mill. The repairs on both are nearly completed; and, no doubt, the report has good foundation. This would give employment to 200 men.

The blast furnace and rolling mills of Wm. Richards & Son, Youngstown, are going in full force.

The manufactured product of Ballard, Fast & Co., of Canton, manufacturers of knives, springs and saws, amounts to about \$1200 per day.

The Champion Works, at Springfield, promise a production of 12,000 mowers and reapers next season.

MASSACHUSETTS.

The New York and New England Railroad Company have erected their repair shops of Norwood, and they will soon be ready for occupancy. The shops consist of two brick buildings, one story, monitor roof, 374 feet long and 70 feet wide, and 200 feet long by 70 feet wide respectively, and are located on the line of the road near the Everett station. The town of Norwood, understanding that the railroad company was favorably disposed to the purchase of fourteen acres of land, but did not wish to pay more than \$200 per acre, voted to raise the difference in price between what the owner valued the land and at what the company was willing to pay, hence the result. In the paint and blacksmiths' shops are placed two iron water tanks the entire length of the building, to be used in case of fire, or for the use of the employees, while a concrete floor is laid in the paint shop. An engine house forms a wing, in which is placed a 130 horse-power double engine. A chimney 75 feet high carries off the smoke. It is estimated that there are over sixteen tons of iron used in the construction of the building, and the roofs are supported by heavy trusses.

All the hands in the Lowell Machine Shop are insured employment through the winter by the acceptance of contracts for the manufacture of \$270,000 worth of machinery.

Notwithstanding the general depression which has marked almost every department of domestic industry during the past six months, the demand for horse nails has not suffered, judging from the following: The Globe Nail Company, of Boston, during the period above mentioned, have run their works on full time, their books from June to November showing a deficiency of goods to fill orders on hand amounting to from 30 to 80 tons.

CONNECTICUT.

Business is livelier than ever, in many respects, at Meriden. The Britannia Company have one hundred men more than ever before.

Machinery is being manufactured at Colt's Armory, at Hartford, for a new screw factory to be located at Berlin.

The American Pin Company, at Waterbury, occupy extensive quarters for the manufacture of pins. Their main building is 100x40 feet, four stories high, and built of brick. They have another building 120x30 feet, and two stories high. The works at present give employment to sixty hands, but during the busy season double that number are employed. There are 75 machines, each machine being capable of turning out 175 pins per minute. The works have a capacity for consuming 20 tons of wire each week, and turning out 94,500,000 pins. The company was organized in 1850, and has a capital of \$300,000.

The knife works at Lakeville are doing a good business, and keeping a full force of men employed.

RHODE ISLAND.

The American Twist Drill Company, of Woonsocket, have recently received an order for \$1500 worth of their machines from Shanghai, China. Also an order to the amount of \$300 from England.

Mr. Charles Bayliss, of Pittsburgh, has invented an apparatus which he has named the "Siberian Combined Furnace," which is thus described: It is called a combined furnace, because it contains melting, fining and puddling chambers, substantially, in one apparatus, all heated from the same source of heat. It has no grate, but a blast device, and can be worked with either solid, liquid or gaseous fuel. The mode of operation is to charge the hearth with coal and turn on the blast; the melting part gets hot in a very short time, the iron is then charged. When all is melted it is tapped and run into the fining chamber, another heat is charged and melted in the same way. When the iron is sufficiently fined, it is run into the third chamber, and puddled and drawn in the usual way. The furnace is capable of producing 50 tons per week, and its advantages may be briefly stated thus: It saves coal, because having no grate it makes no ashes, and the waste heat, escaping from the melting of one charge is utilized in puddling another, so that the two operations go on simultaneously. Another source of economy in fuel is the intense heat generated by the combustion of the graphite in the iron when being fined by the air. It saves fixing, because fined metal does not scour, and furnaces in which it is worked do not require fixing. It reduces the labor of the puddler, as he will not have to fire, charge, melt, clean the grate nor fix his furnace.

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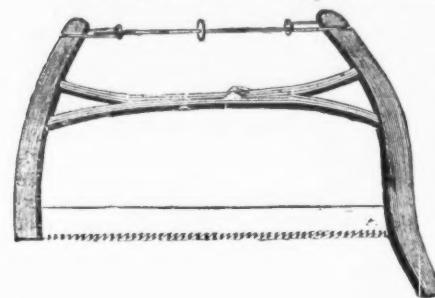
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THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of SPEED AND
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So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE
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Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

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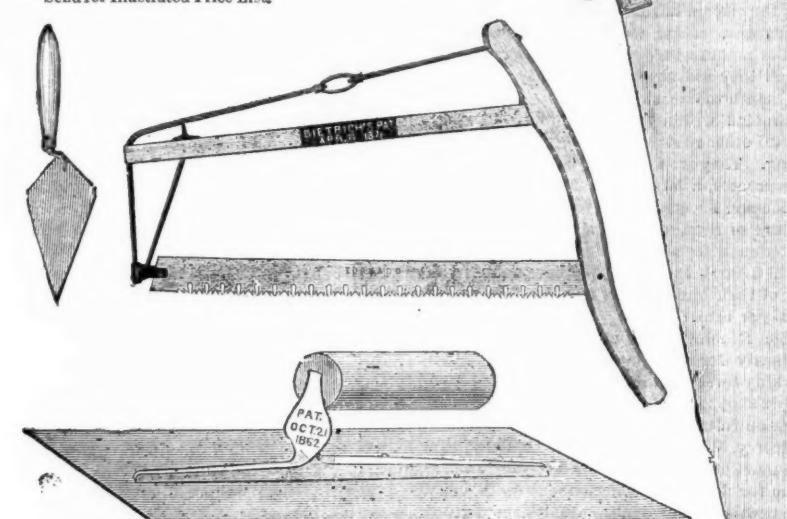
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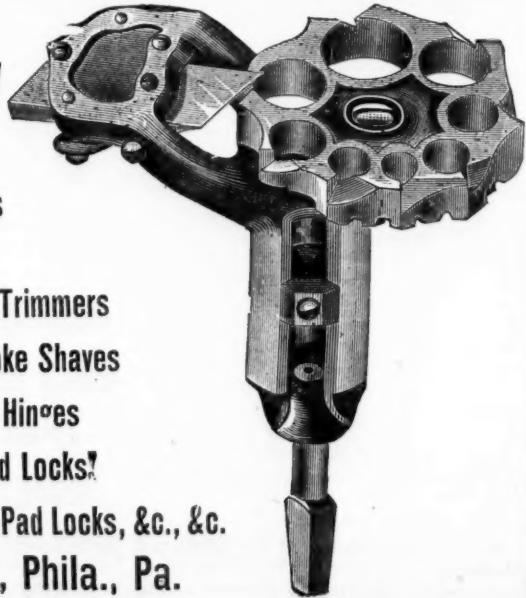
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Two Direct Cutting Edges, instead of one Scraping point.



Note extra steel and durability over the old V, outlined on M tooth.

I am willing and extremely anxious, on proper notice, to accept a Challenge from H. Disston & Sons, or any responsible Saw Manufacturer, and am ready to back my words with appropriate deeds and \$500 expense, if beaten.

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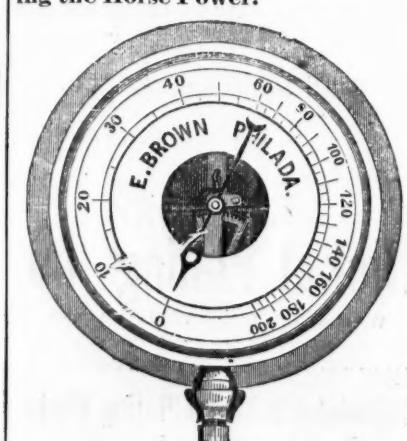


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I make a specialty of the LARGEST SIZES of Circular Saws, and call particular attention of lumber manufacturers to the following points of excellence: Evenness of Temper.—The peculiar structure of my saws subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, the saw being placed on the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention to this important particular. The saw is tightly strained upon the anvil, the heat focused in the center of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This development is under the personal supervision of myself, who has devoted over twenty years to the art of saw making.

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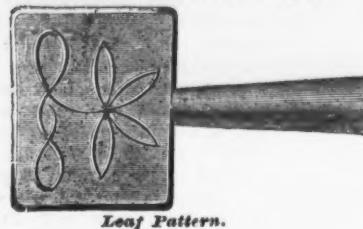
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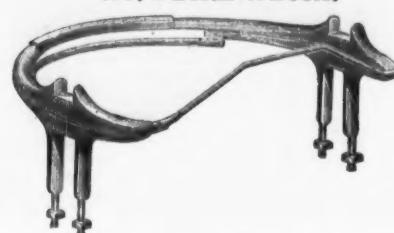
Leaf Pattern.

King Bolt Yokes.



Established 1850.

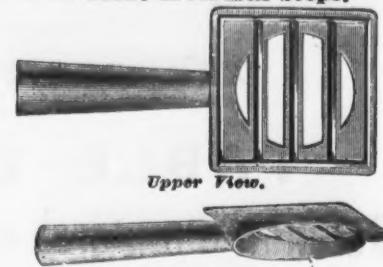
No. 6 Fifth Wheels.



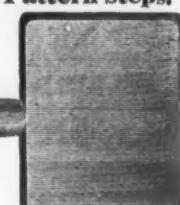
1871 Pattern Shaft Couplings.



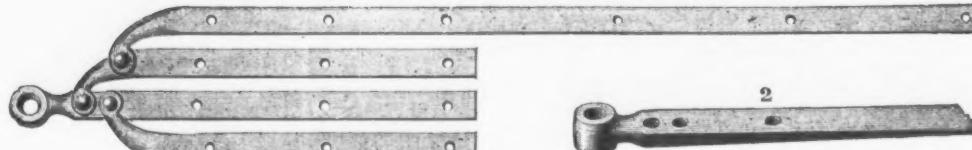
Patent Cross Bar Steps.



Solid Plain Pattern Steps.



Smith's Improved Philadelphia Pattern Slat Irons.



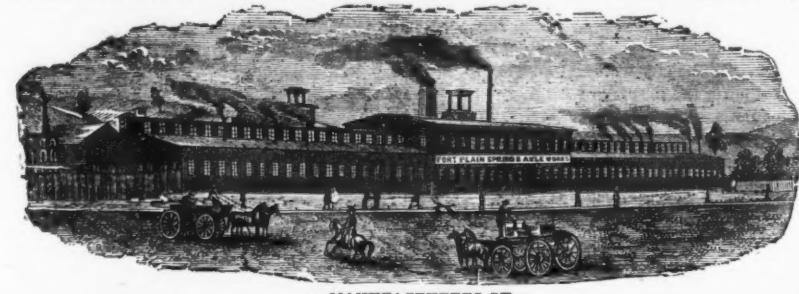
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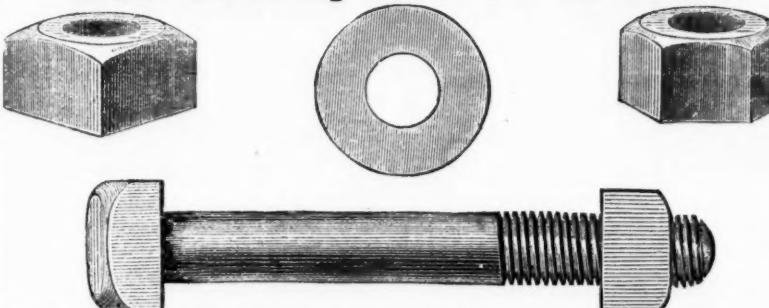
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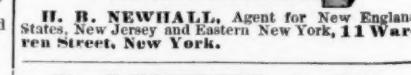
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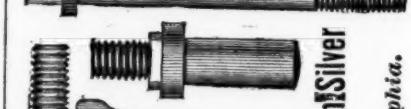


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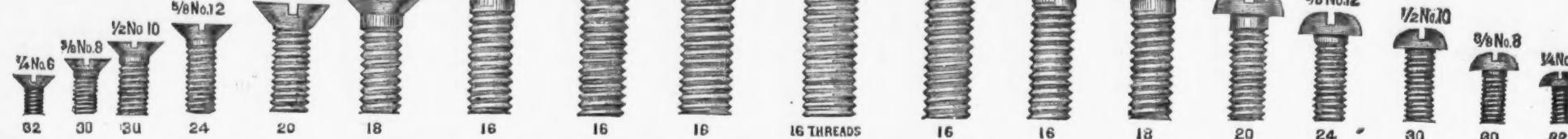


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Price, \$3.50 per pair, 25 per cent. discount.

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Manufacturers of the Best & Most Simple First-Class Sewing Machine in the World.

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This Skate for the Million is unique, simple, light, strong and durable. Quickly and firmly fastened to the foot by the usual button and single toe trap. An elegant, warranted steel skate, at the price of a common iron one.

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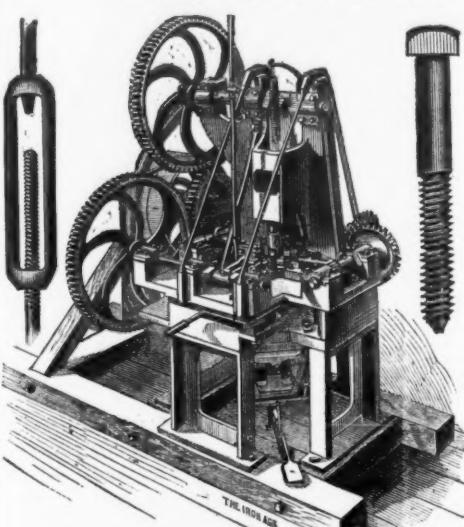
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TACKS & SHOE NAILS, Upholstery, Gimp, Brush, Card & Pail Tacks,

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The Iron Age.

New York, Thursday, November 26, 1874.

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JAMES C. BAYLES Editor.
JOHN S. KING Business Manager.

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CHARLES CHURCHILL & Co., American Merchants, 28 Wilson Street, Finsbury, London, England, will receive subscriptions (all postage prepaid by us) at the following prices in sterling: Great Britain and France, 25/; Germany, Prussia and Belgium, 33/4; Sweden, 50/. They will also accept orders for advertisements, for which they will give prices on application.

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CONTENTS.

First Page.—Palmer's Power Spring Hammer. Directions for the Use of Nitro-Glycerine in Rock Excavations. Elevators. The Calumet and Hecla Mines.

Third Page.—The Warner Process.

Fifth Page.—New Patents. The Lake Survey Nearly Completed.

Sixth Page.—The Deposition of Metals. Planing of Metals.

Ninth Page.—Business Items.

Eleventh Page.—Chains and Car Links by Manufacturers. Manufacturing Interests of Louisville, Iron Trade Difficulties—Lower Wagon Inevitable. Welding Copper.

Fourteenth Page.—Plain Words to the Workmen. The Production and Consumption of Spelter in the United States. The Meeting of Furnace Owners. Needed Reforms in the American Institute Exhibitions. Books of Account and Memoranda as Evidence.

Fifteenth Page.—Philadelphia Correspondence. Is the Socie Basis Attainable? The Charlotte Furnace. The Saratoga Compact.

Sixteenth Page.—The Fire Alarm and Police Telegraph System.

Seventeenth Page.—Trade Report.

Eighteenth Page.—Trade Report—(continued). Our English Letter.

Nineteenth Page.—Meeting of Pig Iron Manufacturers. Blast Furnace and Rolling Mill Enterprise in Texas. Lake Superior Iron and Copper. Construction of Foundries. Domestic Boilers. Carbonized Bricks.

Twenty-first Page.—Plain Words to the Workmen. The Influence of Scarce Labor upon the Price of English Hardware. The Birrod Furnaces.

Twenty-sixth Page.—New York Wholesale Prices of Hardware and Metals.

Twenty-seventh Page.—New York Wholesale Prices (concluded).

Thirty-first Page.—Philadelphia, Buffalo, Cincinnati, and Detroit Hardware and Metal Prices.

Thirty-third Page.—Chicago, Boston, and St. Louis Hardware and Metal Prices.

Plain Words to the Workingmen.

If any argument were needed to show that trade unions, as at present organized and conducted, are fraught with danger to the best interests of all classes of the community, it would be found in the effort now making among those representing several branches of the iron trades, to resist the necessary and inevitable decline in wages which must precede the recovery of that great productive industry from the prostrating effects of the panic. The winter upon which we are now entering promises to be one of almost unprecedented dullness, and both masters and men must recognize this unpleasant fact and act accordingly. Many large iron works have already failed, many more are keeping from bankruptcy by making all the iron they can and selling their product below cost, finding it safer to do this than to stop, although either course must lead to ruin sooner or later; and before spring we may expect to witness the closing of many works now making a great show of unprofitable activity. Already labor skilled in all branches of iron working is greatly in excess of the requirements of the trade, and before the end of the year it will be superabundant. Wages have

it is true, declined from ten to 25 per cent., and in some instances more where neither skill nor experience are required; but the ratio of decline in the price of manufactured iron to the decline in the cost of production has been as two or three to one. This condition of affairs cannot continue. If labor will not yield, our furnaces must blow out and our mills close; and the ultimate consequence of trade union folly will be to drive capital out of manufacturing into other and safer investments, leaving labor without employment. These are plain truths, stated in simple language. The most ignorant workingman can understand them, and the most unreasonable partisan of the trade unions must admit their truth. We have sought earnestly and hopefully for some sign of revival in the iron business that would encourage the hope that better times are at hand; but with all our facilities for learning the exact condition of business in all parts of the country, we have found nothing to warrant the belief that any improvement can be expected before spring. Whether it comes then or not will depend upon circumstances. If wages decline to a point that will enable makers and manufacturers of iron to meet the views of consumers without loss, we may expect a gradual but steady improvement in the consumptive demand, with better prices; if wages do not decline, and manufacturing can only be resumed under existing conditions as regards the cost of labor, the trade will not revive, and we shall have before us another year of dullness and stagnation. In view of these

facts, which no one who knows the condition of the iron trade of this time will venture to question or deny, the folly of strikes to resist reductions in wages is apparent to the simplest understanding. There are in this city 70,000 able bodied men absolutely without employment, and among them are many skilled iron workers, molders, and pattern makers. In all the great iron making districts there is a growing disproportion between the supply of labor and the demand for it, and every week this disproportion becomes greater. The unions may temporarily resist the tendency of the times, and force embarrassed employers in their emergency to accede to unjust demands, but by so doing they will only hasten the end, and bring upon themselves the evil of enforced idleness. We refer such of our readers as are inclined to doubt the truth of these statements, to the report of the meeting of pig iron makers, which we print on another page of this issue.

The Production and Consumption of Spelter in the United States.

Spelter promises to become one of our leading articles of metallurgical production. Out of 9268 tons which we consumed last year, 6743 tons were American. The remaining 2525 were imported. The metal, in its combinations with copper, was known in Europe many centuries before the Christian era, but as a pure metal it was first imported from China under the denomination *tuteraq* or *tulanego*. It was not extensively mined until about the middle of the last century, Upper Silesia, in Prussia, being the principal country of production. The quantity of ore extracted in the Silesian mountains amounted to but 10,000 cwt. in 1783, gradually rising to 17,000 in 1813, 210,000 in 1821, and 309,000 in 1831. The entire Prussian monarchy turned out 1,227,849 cwt. of ore in 1836, and during the ensuing year 995,300. Of metallic spelter Prussia produced in 1826, 195,289 cwt.; in 1829, 132,608; in 1832, 113,179; in 1836, 205,215, and in 1837, 215,466.

Hamburg, the leading European market for the distribution of spelter, received during the ten years from 1843 to 1852 inclusive, 2,175,000 cwt.; during the next ten years, 3,082,000 cwt., and during the decade from 1863 to 1872, 2,841,000 cwt., all from the great inland center, Breslau. From Hamburg it is shipped to all parts of Northern and Central Europe, as well as to the United States, the advances of funds being made to the Silesian mining companies from there, and the spelter consigned in return. A portion of the product of the mines is shipped direct to the inland places of consumption via Breslau, but the bulk goes to Hamburg, thence to be distributed. Hence the statistics given above furnish us very accurate data from which to estimate the production of spelter in Silesia. Reducing the cwt. to tons, it will be found that the amount exported by sea was, on an average, 10,870 tons during the first ten years, 15,410 the second decade, and 14,205 the last.

Our own import, almost exclusively from Hamburg, was as follows:

| Year. | Tons. | Year. | Tons. |
|-----------|-------|-----------|-------|
| 1862..... | 1,400 | 1868..... | 2,385 |
| 1863..... | 2,600 | 1869..... | 4,390 |
| 1864..... | 3,400 | 1870..... | 3,300 |
| 1865..... | 2,400 | 1871..... | 3,590 |
| 1866..... | 4,300 | 1872..... | 4,050 |
| 1867..... | 1,938 | 1873..... | 2,975 |

or, on an average, 3948 tons.

Our consumption of foreign spelter was as follows:

| Year. | Tons. | Year. | Tons. |
|-----------|-------|-----------|-------|
| 1863..... | 4,000 | 1868..... | 3,885 |
| 1863..... | 3,700 | 1869..... | 4,300 |
| 1864..... | 4,100 | 1870..... | 3,650 |
| 1865..... | 3,000 | 1871..... | 3,590 |
| 1866..... | 3,350 | 1872..... | 4,050 |
| 1867..... | 2,128 | 1873..... | 2,525 |

or an average of 4228 tons.

By degrees we are becoming independent of foreign spelter, and it will be interesting to note whence we draw our domestic product:

| Home Production in 1873. | |
|--|-------|
| MISSOURI. | |
| Martindale Zinc Co., St. Louis, Mo. | 1,800 |
| Missouri Zinc Co., " " | 1,400 |
| Carondelet Zinc Co., Carondelet, Mo. | 537 |
| ILLINOIS. | |
| Mineral Point Zinc Co., La Salle, Ill. | 1,004 |
| Illinois Zinc Co., " " | 900 |
| PENNSYLVANIA AND NEW YORK. | |
| Lehigh Zinc Co., Bethlehem, Pa. (inclusive of Passaic Co.'s production). | 586 |
| New Jersey Zinc Co., New York. | 441 |
| New York and vicinity. | 675 |
| | 6,743 |

The Matthiessen & Hegeler Zinc Co., La Salle, consumed its own spelter for sheet zinc. The price obtained for our home product in the New York market is as yet out of all proportion low as compared to the value of foreign in this market. This is in a great measure due to the force of habit on the part of some large brass manufacturers, who, for the sake of uniformity, cling to the foreign article. But gradually the domestic spelter is working itself into favor, and the day will, in all likelihood, not be distant when there will be but a trifling, if any, difference in the market value of European and American spelter at New York.

Several circumstances have co-operated to produce a steadily improving range of prices in Europe. During the early portion of the current year prices of spelter, in common with the other leading metals, had been unduly depressed, while the period of prostration lasted which followed our panic here and in Europe. For a time there seemed to be no bottom to any of them, however well situated from a statistical point of view. Yet, statistically, spelter chanced to be in an exceptionally sound position all along; it was demonstrated and acknowledged so, especially in England; still it shared in the general demoralization till the stock at London had sunk so low that it amounted to but 12½ per cent. of an average available supply. While this had been preparing, an extra demand manifested itself for France, armaments lying at the bottom of it. The summer being an unusually dry one in Germany, there was a lack of water in the mountains for power, and for carriage down to the shipping places; hence a diminished production and conveyance by rail had finally to be resorted to, and the cost of the metal was enhanced, superadded to which came the greater buoyancy of the general metal markets since the commencement of last month, causing a continual hardening process, from all appearances not yet arrested, so far as this metal is concerned.

Although the general metal markets have been rapidly advancing, they are as yet far from having reached the extreme range that ruled the value of copper and spelter subsequent to the last Continental war, during the year 1872. Should peace be preserved, money remain tolerably easy, and trade prove brisk in the spring, it is not unlikely that the highest prices will be recovered, which circumstance would then greatly operate to the advantage of this growing industry—the production of spelter.

The Meeting of Furnace Owners.

On another page we publish a telegraphic report of the meeting of pig iron manufacturers held on Tuesday at the rooms of the American Iron and Steel Association, in Philadelphia. The view of the condition and prospects of the iron trade taken by the meeting, as expressed in the resolutions adopted, is gloomy indeed, though fully warranted by the facts of the case. The unanimous opinion of those present was, that the only way to save the iron trade from ruin is to further curtail the production of pig metal. Considering the number of furnaces already out of blast, this is practically, to a recommendation that production be almost wholly stopped. In this matter, as in all others affecting their business policy, manufacturers will probably be governed by considerations of self-interest, and we doubt very much if they will be influenced in any material degree by resolutions or the reports of committees. It must be admitted, however, that it is the part of wisdom just now to avoid piling up stocks of pig iron to depress the market when there shall be a revival of the consumptive demand. Whether it is more hazardous to blow out or to sell iron at or a trifle below cost is a question which every furnace owner must and will decide for himself. Probably there are some who cannot afford to blow out so long as they can sell iron at any

price, and others who can make running expenses out of current sales of their higher grades of pig iron. But it cannot be denied that the resolutions given in our report of the meeting point out the only way in which the trade of next year can be saved from the depression which has characterized the trade of this. The feeling now prevails among well informed representatives of the iron trade with whom we have conversed during the past few days, that iron will go still lower, and that next year will see prices quoted far below the lowest yet reported. We hope this prediction will fail of realization, but nothing will insure that result sooner or more certainly than a continued over-production and the accumulation of large stocks of pig iron to be forced upon the market at any price which can be obtained for it.

Comparatively few of our ironmasters can afford to carry stocks for any considerable time, and so long as makers stand ready to meet the views of consumers, so long will we have a depressed market, a lack of confidence, and general "hard times" in the iron trade.

Needed Reforms in the American Institute Exhibitions.

The forty-third exhibition of the American Institute closed on Saturday night. As a place of resort for throngs of people, young and old, it served an excellent purpose; as an exhibition of the industrial arts, manufactures and products of the country, it cannot be said to have amounted to very much. There were, of course, many interesting and important exhibits which would well repay examination had one been able to find them among the countless commonplace articles shown merely to advertise the manufacturers. But, as a whole, the exhibition was a disappointment, and one saw in every department the same old things which had been shown from year to year since our earliest recollection. For this

court a copy of the marks on the shop. Held that the copy was not evidence, not being the original entry. The rule as to any memorandum is the same as to entries in an account book. See *Guy v. Mead*, 22 N. Y., 465, also *Halsey v. Sinsbaugh*, 15 N. Y., 485.

The case of *Stroud v. Tilton*, 3 Keyes, 139, was a Court of Appeals decision. It was a suit for services. The plaintiff proved that the usual course of business in his establishment was to enter each day's work on a slate, that the entries were then transcribed from day to day by the bookkeeper in a book, and the entries on the slate were erased. The court held that the book should be admitted in evidence, it having been proved that the entries were transcribed from day to day in the usual course of business.

In *Sickles v. Mather*, 20 Wend., 72, the entries were made on a slate, and every day or every two or three days they were transcribed in a book. Held that the book was evidence. A case was there mentioned of a butcher, who marked sales of meat in chalk on his cart, and every day on the return of the cart from the daily trip, the partner of the butcher transcribed the marks in a book, and the book was admitted.

In *Merrill v. I. & O. R. R. Co.*, 16 Wend., 586, a case is cited in which the witness, a clerk, was allowed to use the ledger as a book of original entry, where he had first entered the sales in a waste-book, which the plaintiff copied day by day in the ledger in the clerk's presence, who checked them as they were copied.

In the next place, the party who made the entry must be produced as a witness if he is living. In the case last cited, the plaintiff offered books of account kept by various superintendents of different sections of a railroad, in which were entered names of laborers under them, and the number of hours each worked every day. Sometimes in the absence of the superintendents their clerks made entries. A few of the superintendents, but not all, testified as to the entries, and none of the clerks were produced, and it was not proved that the absent superintendents and clerks were dead. It was held that the books should be excluded on this account.

In *Stroud v. Tilton*, cited above, it was proved that the clerk who made the entries was dead, and upon this proof the book was admitted with further proof that the entries were in the handwriting of the deceased. In some States the books are admitted upon proof that the clerk is beyond the jurisdiction of the court or out of the State; in others the rule is that the testimony of the clerk must be obtained, if he is living, no matter where he is. (See *Brewster v. Doane*, 2 Hill, 537.)

Again, the entry is not admissible, unless made at or near the time of the transaction. In some of our States it has been held that the entry must be made the same day of the transaction, or the next day after. Greater latitude was allowed in *Sickles v. Mather*, cited above. There the entries were transcribed from the slate into the book "every day or every two or three days." This, it is believed, is the longest time spoken of in any reported case, and in this case it was the regular course of business.

In *Halsey v. Sinsbaugh*, 15 N. Y., 485, it was said that an original memorandum made by the witness *presently after the facts happened*, and proved by the same witness, may be read by him in evidence. In *Russell v. H. R. R. Co.*, 17 N. Y., 134, it is said, that it is the duty of the court to see before receiving the memorandum in evidence, that it was made at or about the time of the transaction.

In the next place, it must be proved that the witness does not recollect the facts, before the book or memorandum will be allowed to be evidence of them. If the witness remembers the facts, he must testify from his memory; if after refreshing his memory by looking at the entry, he remembers the facts, he must testify to them from his memory; but if after doing this, he has no recollection whatever of the facts, but can say that he does not doubt the correctness of the entry, it will then be allowed in evidence. In *Marclay v. Shultz*, cited above, one reason for excluding the memorandum was that it was not shown that the witness did not remember the facts without it.

In *Guy v. Mead*, 22 N. Y., 465, the court decided that original memoranda may be put in evidence even if the witness has wholly forgotten the facts, and this need not be entries in the usual course of business, but may be any memorandum. To put it in evidence, however, it must be shown that the witness did not have a perfect recollection of the facts sought to be proved by the memorandum.

In *Russell v. H. R. R. Co.*, cited above, the court say: "A witness who says that after refreshing his memory by a written memorandum made by himself at or about the time of the occurrence, he cannot recollect the facts, but that he is confident that he knew the memorandum to be correct when it was made, is not required to swear to the facts in positive terms, but the memorandum itself is received in connection with, and as auxiliary to, the oral testimony." * * * "It is, however, an indispensable preliminary to the introduction of such a memorandum in evidence, that it should appear * * that the witness is unable with the aid of the memorandum to speak from memory as to the facts."

In *Conkin v. Stanler*, cited above, it was decided that the rule as to books is that the party must resort to them to refresh his memory, and in case they fail to refresh his memory, he can then put them in evidence provided he can swear that he has entirely forgotten the facts, and can swear that he would not have entered them if he had not known them at the time to be true, and that he believes them to be correct.

Again, the rule requires that the books be shown to be the books of account of the party, and that he keeps correct books. This was first clearly laid down in *Bosburgh v. Thayer*,

12 Johnson, 461, where it is said that it must be shown that the party keeps fair and honest accounts by witnesses who have dealt and settled with him by his books. This portion of the rule has been recognized in several decisions since. It is spoken of as one of the necessary preliminaries to the admission of books of account in *Stroud v. Tilton*, cited above, where the court say: "The general correctness of the books was shown by those who had dealt with the plaintiff, and the accuracy of the charges in question was verified by his own oath." It was further said: There is no force in the objection that the witnesses who proved the correctness of the books settled their accounts by the ledger, without examination of the original entries. If the charges as posted and paid were honest, it is to be presumed that they were correct as entered in the day books."

Lastly, it must be shown that one or more of the articles specified in the account were actually delivered. In *Conklin v. Stanler*, cited above, the only proof was that the plaintiff had no bookkeeper, and that persons dealing with him had settled with him by his books. There was no evidence that the defendant dealt with him, or of the delivery of any of the articles, and the case was reversed for this reason. In *Stroud v. Tilton*, the court speak of part of the property having been delivered to defendant as necessary preliminary proof. This was a suit for work and materials furnished in making and repairing guns, and the evidence showed that one of the guns had been delivered, which was held sufficient.

The action of *Merrill v. Whitehead*, 4 E. D. Smith, 239, was for physician's services, rendered between April 1851 and 1853. The proof showed that once in 1849 the physician had attended the defendant. The court said that proof of a single attendance two years previous to the entries in the book was wholly insufficient to satisfy the rule, and for that reason the book ought not to have been received.

It will be readily seen from the strictness of this rule that it is often difficult for a merchant to recover in an action on an account. It is sometimes difficult and always expensive to procure the testimony of the clerk who made the entries, when he is absent in a distant State or foreign country. Sometimes the clerk has been dismissed and is hostile to his employer. Merchants often fail in proving a delivery. The clerk who made the entries often does not see an article delivered, and it is sometimes difficult to obtain the testimony of him who actually made the delivery. Sometimes the articles are called out to the bookkeeper by another clerk as they are delivered. The bookkeeper in that case cannot swear as to the correctness of the entry, and he who made the calls to him must be produced, or it must be shown that this was the usual daily course of business. It is sometimes not easy to prove even that a merchant kept correct books, especially if he has been long out of business or is deceased. In *Merrill v. Whitehead*, cited above, the court said: "Where the book is supported only by the oath of one witness who testifies that he has settled thereby and found it correct, and is impeached by the evidence of another witness, who testified that he has settled thereby, or on settlement has examined the same for that purpose and found it incorrect, and that on such settlement the error was corrected, the book ought not to be deemed sufficient evidence to warrant a recovery unless there is something disclosed to discredit the testimony of such impeaching witness."

The reason why the rule of the law is so strict is that the books are an unsworn statement made by the party himself in his own favor. When, however, the books are properly authenticated under the rule, they are evidence for the party even after his decease and the decease of his clerks and bookkeeper.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Nov. 23, 1874.

As winter approaches the discontent among the laboring classes appears to increase, and in all directions we learn of strikes, labor contests, and growing difficulties. From Pittsburgh the most threatening accounts are received of the determination of the boilers and other mill hands to resist any reduction of wages, while the manufacturers are as positive in their intentions to stop all production unless its cost is lessened. In the coal regions, especially in Schuylkill and Luzerne counties, the lawlessness of the miners is becoming such as to seriously endanger life and property, and to call for the interference of the authorities. This state of affairs is not likely to be decreased by the approaching stoppage of all the Reading Coal and Iron Company's collieries very shortly, and the entire cessation of coal production in the Schuylkill coal field by the 20th of December. What the thousands of miners and those dependent on them are to do without earnings until spring, does not appear, but idleness will not improve either their physical or moral condition. Even in this city, where the working classes are, as a rule, better employed than in most other places, the Mayor is constantly receiving letters of a threatening character and agrarian tone, promising riot and arson unless employment is provided. With such a state of things existing the coming Congress will enter upon its duties with a lively apprehension of an exciting session, in which action will be stimulated by popular expressions most forcibly put. Capitalists are said to be growing apprehensive of new measures looking to so-called inflation; but in the present condition of the national credit, the country can better stand an increase of indebtedness than a continuance of the stagnation which will ultimately produce the same effect by decreasing the taxpaying power of the people.

As this is the documentary period of the year, we begin to receive the reports of heads of departments; the most important of which

to hand is that of the Commissioner of Internal Revenue. This document shows that the receipts from all taxable sources coming under special taxation were very considerably in excess of the estimates, as also of those of the previous fiscal year, and notably that notwithstanding the much vaunted economy since the panic, the receipts from liquors, cigars and tobacco were far greater than ever before. Indeed, these articles are shown to be highly valuable articles of national revenue, whatever they may be of individual health or morality. On the whole, the report shows a rather agreeable state of affairs, and if all the other departments are to furnish such rose colored reports for the panic year, we will wonder what we have to complain of.

We have had here recently two rather curious decisions in commercial law. The first is by the Supreme Court of Pennsylvania, involving the liability of a firm for a note indorsed in the firm name by one partner without knowledge or consent of the other members. The facts are as follows:

The Second National Bank of Titusville brought suit on an indorsement of Collins Brothers on a note bearing the name of the firm, given without the knowledge or consent of the other members. The bank, plaintiffs in the lower court, having filed a copy of the note, setting forth the fact that it was so indorsed; that the firm had no interest in the note, and never received any consideration for the indorsement thereof, and that it was not indorsed in the regular course of their business. Two of the members swore that they never received any notice of protest, but the third did not.

Upon a rule to show cause why judgment should not be entered for want of a sufficient affidavit of defense, the court entered judgment for the plaintiff.

The higher court expressed the opinion that notice of protest to one member of a firm was sufficient, and affirmed the judgment in favor of the plaintiff.

The second case comes under the law of trade marks, and was a decision by the Court of Common Pleas, of this city, in a motion for injunction against alleged infringement. The plaintiff, manufacturer of an article of stove polish, having adopted as his trade mark the title of "Rising Sun," accompanied by a design representing that luminary, applied for an injunction restraining defendant from the use of a similar trade mark, in device and color, with the simple substitution of "Moon" for "Sun." The court decides that the sun and moon are radically different luminaries in trade mark law, even when both printed in the same ink, on the same colored paper, and that no infringement was committed sufficient to justify injunction. This shows how nicely lines may be drawn in legal commerce, but is not encouraging to commercial morality.

Mr. Henry C. Carey has just published the first of a series of open letters to the President on the subject of the Commercial Treaties of 1871 and 1874, or, in other words, of the Reciprocity Treaty. Mr. Carey shows, as he always does, by facts and figures, the iniquity of this measure, which seems to receive hard knocks all around. By a tabulation of balances of trade with the Dominion for the periods from 1863 to 1866, he shows that under reciprocity previously our sales in the Dominion steadily declined, while our purchases materially increased. So plainly was this evident that in a report before the Senate in 1871 the evil effects were universally admitted, and it was only by the secret and unprecedented effort to foist the present negotiation upon that body that the subject was reopened. In subsequent letters Mr. Carey promises to invite the President's attention to the fallacy of the statements contained in the document proposing the treaty of 1874. As he is most thoroughly and efficiently armed with authorities, and moreover possesses an amount of patriotic honesty quite unusual in public life, our industries may be sure the Reciprocity fraud will be most fully and thoroughly ventilated before the present Congress meets.

While noting the numerous devices of free trade, among which is a threatened move on the part of importers of textile fabrics at the next session, we have to chronicle a counter movement proposed here. This is a display, under the auspices of the Franklin Institute, of American textile fabrics, to open about December 15th next, and continue some thirty days or more. It is said the Textile Fabric Association, the New England Manufacturers' Association and the American Silk Association will all co-operate, and while the success of the show as an exhibition of American manufactures will be very marked, the effect against any reduction in duties will be equally so. It would be a good idea for the iron trade, or such branches as are threatened with the attacks of free trade, to join in a similar movement, and show comparative samples of American and English irons, with actual wages, cost of manufacture, etc., of each.

The coming meeting of the furnace owners, to agree on a policy of universal stoppage, is attracting a good deal of attention. Could this be effected, it would undoubtedly advance iron or reduce stocks, but it is very doubtful if, under the very different conditions dominant in the various sections, any such action could be made universal, or even, if agreed on, could be maintained.

So far as pig iron is concerned the trade is worse than dull. Possibly a stoppage would help it, but at a cost to both capital and labor which would be at least equal to any benefit.

Is the Specie Basis Attainable?

The answer to this question must depend very much upon what particular condition of things we have in view in using the term specie basis. If we contemplate, in the idea of resuming specie payments, a state of affairs in which not only will the treasury stand prepared to pay all its obligations in gold, but the banks also will be obligated to honor their notes and to pay their deposits in specie; if we have in view the restoration of the same obligation to pay government, bank and private debts in gold as existed prior to suspension; we fear that the obstacles to the end sought must be pronounced almost if not absolutely insurmountable. For what does resumption in this sense imply? We will rid the question of one important difficulty by supposing that the legal tender notes, either by funding or some other means, have been got out of the way, so as to relieve the treasury of any necessity to hold a stock of gold to provide for the redemption of its circulating notes, thus placing the problem in the easiest form possible. The treasury, however, would still have to provide for large periodic interest payments aggregating \$100,000,000 a year, in addition to its regular daily disbursements; and, to provide for these demands, we think it will be conceded that an average coin balance of about \$30,000,000 would be regarded as necessary to be maintained in the hands of the government.

Next, would come the specie requirements of the banks. United States notes being, upon the supposition here entertained, no longer a part of the lawful money of the nation, their present place in our banking arrangements would have to be filled by specie. The amount that would be required may be judged from the fact that the national banks hold about \$650,000,000 of deposits and the State banks probably fully \$70,000,000, making a total of \$700,000,000 of deposits. Beside this, the banks have \$350,000,000 of demand notes outstanding; and, if the "greenbacks" were withdrawn, it would be found necessary to supply their place by bank notes; which would increase the bank note issues up to about \$700,000,000. Now it will hardly be supposed that the banks, even if freed from all legal compulsion in the matter, would keep a lower reserve against their deposits than 20 per cent.; the probability rather is that this form of reserve would average higher than that ratio; on the rate, however, we have suggested as a minimum, the banks would require an aggregate coin reserve against their \$700,000,000 deposits of \$140,000,000. The note obligations of the banks, considering the bond security by which they are backed, could not be regarded as needing so large a reserve as deposits. Assuming that 10 per cent. might be regarded as adequate, then the amount of reserve required against the requisite note issues—supposed as above to be \$700,000,000—would amount to \$70,000,000. The banks, therefore, would require, as the minimum amount of reserve against deposits and circulation combined, \$210,000,000 of specie.

To provide, however, against possible variations in the demand for gold, connected with the revenue and with the exports to foreign countries, the banks would need to hold an amount in excess of the minimum reserve requirements, or, say in all \$225,000,000. How far this estimate is fair may be judged from the fact that for the five years next preceding 1861, under just such a specie basis as we are supposing to be contemplated for the future, the deposits and circulation combined averaged \$428,000,000, while the specie averaged \$78,000,000. The reserve we have suggested as necessary for the supposed state of things in future would be 16 per cent. on the circulation and deposits combined; while for the six antebellum years the ratio averaged 18½ per cent. Beyond these requirements for specie, a certain amount would be needed for circulation in the hands of the people. Immediately before the war the amount of coin thus circulating was generally estimated at about \$75,000,000; but as our now improved bank note commands more confidence than that form of currency did before the war, we may stipulate the much more moderate figure of \$40,000,000 as sufficient to satisfy these wants in the Atlantic States. Summarizing these various coin requirements, we have the following result:

| | |
|-------------------------------------|---------------|
| Required for Treasury purposes..... | \$30,000,000 |
| " Banking reserves..... | 225,000,000 |
| " " active circulation..... | 40,000,000 |
| Total..... | \$295,000,000 |

These estimates are based upon the narrowest ideas of banking requirements, and are far from coming up to the standard set up by the advocates of "conservative" banking, and the rates of bank reserve contemplated are less than half those insisted upon under the European financial systems. If, therefore, we have erred in these figures, it is on the side of under-estimation.

It follows, then, that to undertake the resumption of specie payments, on the basis supposed at the outset of our remarks, we must have a stock of specie in the Atlantic States amounting to not less than \$300,000,000. We have already, in the Treasury, in the banks and in private hoards about \$90,000,000 toward that amount, and would therefore need to accumulate \$210,000,000 of additional supply. Where could this amount of the precious metals be procured? We know of no sources of supply except those already existing in the European banks and the current product of our mines. What could we hope to get from either?

In the national banks of England, France, Prussia, Austria and Belgium, there is now an aggregate stock of \$600,000,000 of the precious metals. Nine-tenths of this amount is required to enable these institutions to conform to the legal conditions on which they are required to conduct their operations; and to part with the remaining one-tenth (amounting to \$60,000,000) would produce a stringency in the European money markets verging closely on general panic.

It so happens, owing to the peculiar exchange relations between the several European money markets, that when any unusual amount of specie is withdrawn from Europe, the weight of the demand falls first and chiefly on the Bank of England; and it is not necessary to state what is the effect on that very sensitive financial organism of a withdrawal of even \$20,000,000 from its vaults. Its vast power over the exchanges of the whole world are at once put in force to draw back the lost treasure, and the world's money markets are allowed no rest until the bank's reserves are again squared with the conservative ideas of its managers. There are many who have talked glibly of our importing \$200,000,000 of gold from Europe, but we have yet to be informed by what sort of financial legerdemain the feat is to be achieved of abstracting from the European banks gold which they cannot and will not part with. Is our power over the Bank of England, the Bank of France or the Bank of Prussia so preponderating that we can compel them to transfer their gold to us at will? Can we, either by selling bonds abroad or by increasing our exports over our imports, draw more gold from London than the Bank of England is willing to part with? No; and for the reason that, in a contest between the money markets of London and of New York, the latter always proves the weaker. Even assuming that, by a shrewdly conducted negotiation, we could sell

\$300,000,000 of government bonds in Europe, thereby giving us a claim on that amount of foreign gold, the effect on the London money market and on the exchanges would be such as to stop entirely the ordinary negotiations of our corporate loans in Europe, amounting to about \$100,000,000 per annum, to send back large amounts of our securities, to induce European consignments of goods to this country, and to reduce the value and the volume of our exports—for this is the way in which an adverse condition of the London money market always operates on our interests—and therefore any gold that we might acquire by such a process would be much less in amount than was expected, and it could be retained only very temporarily, for a few weeks or months at most; we must inevitably surrender it back to the stronger party in the contest. For these reasons, we think it will be admitted that the idea of drawing a stock of gold from the European reservoirs betrays an entire ignorance of or indifference to the nature and workings of the foreign exchanges, and must be abandoned as hopeless.

Nor is there any better prospect of our being able to detain at home any material portion of our current production of gold. The current supply of the precious metals from the United States is as indispensable to the financial and commercial system of Europe as are its present stocks of them; and to withhold any portion of our production would react upon us in just the same way as would a withdrawal from their existing supply. To retain at home, by some forcible process, so many millions of the yield of California, would be to deprive us of so much means for settling our current foreign indebtedness; which would produce embarrassment in the exchanges that could result only in one possible way, viz., to compel us to retain an amount of specie equal to that we were arbitrarily holding back. Such an attempt at forcible hoarding could cause a vast amount of injury

The Fire Alarm and Police Telegraph System.

To any one who reflects upon the rapid progress usually made by a fire, it is obvious that the saving of a very few minutes—oftentimes the saving of a minute, even—is of the greatest importance, and may make the difference between a trifling loss and a destructive conflagration. It is a matter of common observation that most fires are discovered before they have made great progress, and at a time when they might easily be subdued if the means were then at hand. Actuated by these considerations, Dr. Wm. F. Channing, of Boston, in the year 1845—just one year after the introduction of the electro-magnetic telegraph into the United States—suggested the possibility of telegraphic fire alarms, and published the details of his plan.

The first mention of such a thing attracted some attention; but, like the telegraph itself, it was regarded as of doubtful utility, and capitalists would render no aid to its introduction. The fact is, but few minds had the faintest conception of the importance and endless variety of applications of the new-born art of electro-magnetic telegraphy. It was not until 1851 that the City of Boston could be induced to appropriate \$10,000 to try the experiment. Calling to his aid Mr. Moses G. Farmer, of Salem, one of the best electricians in the United States, who devised most of the original apparatus, Dr. Channing put his system in practical operation during the spring of 1852. Although far from perfect in detail and construction, the grand idea was developed. From that day to this—a period of over 18 years—electricity has kept watch over millions of lives and property in the principal cities of the United States and British Provinces. Experience has proved it an ever vigilant and faithful sentinel. It not only affords the means of giving an instantaneous alarm in case of fire but indicates its exact locality, by which prompt and definite action a limited supply of water is more effective in preventing large conflagrations than the best water works would be without a telegraph.

Since its introduction in 1852 many valuable improvements have been made and patented. Its introduction and satisfactory operation in fifty-six cities attest the truth of what Professor Henry, the intellectual giant of the Smithsonian Institute, has said of it, viz.: that "it is one of the most ingenious and successful applications of electricity to the business of life which has yet been made."

THE AUTOMATIC SYSTEM.

The automatic system is fully adapted to the wants of all but the very largest cities, and its apparatus and operation may be briefly described as follows:

1st. The signal boxes, from which alarms are conveyed to the bells and gongs.

These boxes are of cast iron, cottage shaped, with combination locks, and each box is provided with its distinctive number. Every box contains the necessary mechanism, operated by clock work, the motor power of which is a weight or spring, to open and close an electric circuit a definite number of times and at certain intervals, in such a manner as to indicate, by the number of blows upon the alarm bells and the intervals between, the exact number of the box from which an alarm originates.

This mechanism is set in motion by the mere pulling down of a brass hook or knob, which is plainly visible on opening the outer door of the box—and this action is all that is necessary to create an alarm of fire. So perfect is this mechanism that it is utterly impossible for any other than the correct signals to be transmitted, and when once started it can in no way be interfered with until it has performed its entire work.

These signal boxes are located at different points of a city, with a view of protecting the largest amounts of property, and are securely fastened to buildings or poles.

2d. The bell strikers, for sounding alarms upon large bells. These are properly termed electro-mechanical—the mechanism, which is operated by weight power, being held under check and control by an electro-magnetic escapement. By these machines the power is unlimited, giving the full tone of the heaviest bells.

It is not necessary that bells should be especially provided for fire alarm purposes where the telegraph is used, as the bell strikers can be attached and used with any school or church bell without in any way interfering with their ordinary use. In the city of Boston about fifty large bells are in use for fire alarm purposes, in connection with the fire telegraph, nearly all of which, are church and school bells.

3d. The electro-mechanical gong strikers, for engine houses, by which alarms are given sufficiently loud to awaken the members of a fire department, if asleep in their quarters. These gong strikers are operated upon the principle of using electricity simply to control mechanical power.

Two sizes are furnished—one with a gong fifteen or more inches in diameter, for engine and hose houses, the other with a gong six or seven inches diameter, for engineers and fire commissioners, for use in their residences or places of business.

4th. The automatic repeater.—This instrument, which is located, with all the batteries used, at some central point, is really the heart of our automatic system of fire telegraph. Its use permits the distribution of the signal boxes, gong and bell strikers, upon a number of lines or circuits, depending upon the size of the city, and so arranged that a break or interruption of any one will not impair the efficiency of the others.

Through this instrument an alarm coming from a box on one of the lines is automatically repeated to all the apparatus on the other circuits, thus dispensing with the services of operators and watchmen, and a portion of only one

man's time is required to keep an entire system in order.

In case a battery becomes too weak to work efficiently, or an intentional or accidental interruption occurs to any part of the wire, in an instant notice is given by one blow upon all the alarm bells and gongs, calling attention to its temporarily disabled condition; thus not only keeping watch over the city, but actually watching itself, and guaranteeing reliability every moment.

In several of the larger cities, as Milwaukee, Newark, &c., the systems are most successfully worked by the chief engineers of the respective fire departments without conflicting with their other duties.

The signal boxes, gong and bell strikers described above, are connected with the battery and automatic repeater by wires, which are securely fastened upon the tops of the highest buildings or upon poles.

HOW AN ALARM IS GIVEN.

We will suppose a fire breaks out in a city where the automatic system of fire telegraph is in use—the person who first discovers the fire runs to the nearest signal box, and obtaining a key, which is easily accessible, he opens the outer door of the box and pulls down the brass hook, which is plainly in sight, once only, and lets go. Before he can turn his back upon the box its clock work is in motion, and an alarm is being sounded upon the little bells in every signal box, the gongs in the engine houses, and upon the large tower bells. Suppose the hook of box twenty-one has been pulled, the blows upon the bells and gongs will be given thus: 1-1 (two blows), then a pause of five or six seconds, and then 1, making 21, and this is repeated five times. If this is not considered sufficient another pull of the hook will give the alarm five times more. Now the localities of all the boxes being well understood by the firemen, they run directly to that box from which the alarm originates, and no time is lost in hunting for the fire.

THE CENTRAL OFFICE SYSTEM.

This system differs from the automatic in that all alarms from the signal stations are transmitted no farther than a central station, where operators who are on duty day and night receive the signals and set the apparatus in motion, which repeats the alarms upon the bells and gongs.

It is only in the very largest cities, where a very large number of instruments and a great amount of wire is in use, that the central office system is needed.

ADVANTAGES CLAIMED FOR THE FIRE ALARM TELEGRAPH.

It furnishes to every property holder the means near at hand, in case of fire, of giving an instantaneous and definite alarm, and this means the saving of thousands of dollars in property, and even of human life. It saves the first ten, twenty or thirty minutes' time after the discovery of a fire, which is inevitably lost where the ordinary means of creating an alarm is relied upon. It is the cheapest insurance which property holders can secure upon their buildings.

It is the only insurance which a city, in its corporate capacity, can place upon the property generally from which its revenue is derived in the shape of taxes. Every building in a city pays a certain amount in taxes into the city treasury. If burned or destroyed, so far as the city is concerned, it is a source of revenue gone. This consideration alone should induce city governments to spare no means or reasonable expense to prevent conflagrations.

It saves all and more than its running expenses, through the almost entire suppression of false alarms and unnecessary wear and tear of the fire apparatus incident thereto.

It saves the necessity of turning out an entire fire department at every alarm of fire. That portion of the department only which is nearest the signal box from which an alarm is sounded need respond. In every signal box there is a telegraphic signal key, by the use of which the chief engineer or his assistants can summon an additional force if they deem it necessary.

In case of riot, by the use of a code of signals which has been agreed upon, it may be used by the police to summons assistance. It is very important to property holders, as affording them prompt information, day or night, of the locality of a fire, so that they may know whether or not any of their own property is in danger.

It may be used to establish standard time throughout a city. With an instrument placed at any point where correct time is kept, and properly connected with the telegraph, the alarm bells may be sounded at mid-day, or at any hour desired. This not only furnishes correct time, but serves to test the working condition of the telegraph, and insures its integrity.

The use of the fire alarm telegraph renders the employment of a large number of steam fire engines unnecessary. The reason of this is apparent: a small number of engines will be worked much more effectively in the early stages of a fire than a larger number after the fire is well under way. Quite a number of cities have avoided the necessity of adding to their fire apparatus by introducing the fire alarm telegraph, at much less expense than inevitably attends the purchase of a single steamer.

An independent wire may be run between the chief engineer's and all the engine, hose and ladder houses, connecting signal instruments for the transmission of orders and general communications. While the use of this "talking circuit" in no way affects the alarm circuit, yet all alarms of fire are repeated upon it; or, in other words, an alarm of fire is not only sounded upon the engine house gongs, but is repeated upon the small call bells connected with the talking circuit—thus affording a double system of alarms.

Finally, it secures the reliability, vigilance, efficiency and discipline of the fire department.

But, after all, the best evidence of its great value is in these facts, that it is now in actual operation in 56 cities of the United States and

Canadas, and in process of construction in several others, and that in no single instance has its use ever been abandoned or even temporarily given up.

The following named cities are referred to:

| | |
|---------------------|----------------------|
| Albany, N. Y., | New York City, |
| Allegheny, Pa., | New Bedford, Mass., |
| Boston, Mass., | New Orleans, La., |
| Buffalo, N. Y., | New Haven, Ct., |
| Baltimore, Md., | Newark, N. J., |
| Bridgeport, Ct., | Omaha, Neb., |
| Chicago, Ill., | Philadelphia, Pa., |
| Cincinnati, Ohio, | Pittsburgh, Pa., |
| Columbus, Ohio, | Portland, Me., |
| Cambridge, Mass., | Peoria, Ill., |
| Charlestown, Mass., | Providence, R. I., |
| Covington, Ky., | Quebec, Canada, |
| Dayton, Mich., | Rochester, N. Y., |
| Elizabeth, N. J., | Richmond, Va., |
| Fall River, Mass., | St. Louis, Mo., |
| Fitchburg, Mass., | St. John, N. B., |
| Hartford, Ct., | Springfield, Mass., |
| Indianapolis, Ind., | San Francisco, Cal., |
| Jersey City, N. J., | Savannah, Ga., |
| Louisville, Ky., | Syracuse, N. Y., |
| Lawrence, Mass., | Taunton, Mass., |
| Lynn, Mass., | Troy, N. Y., |
| Mobile, Ala., | Terre Haute, Ind., |
| Montreal, Canada, | Toledo, Ohio, |
| Milwaukee, Wis., | Toronto, Canada, |
| Manchester, N. H., | Washington, D. C., |
| Newport, Ky., | Worcester, Mass. |

COST OF INTRODUCTION.

The running expenses of the automatic system is a mere nominal matter—a few hundred dollars a year. The cost of construction will, of course, depend upon the amount of apparatus required, and the extent of territory to be covered; but every town or city possessing a steam fire engine can afford to have the fire telegraph—in fact, cannot afford to be without it.

It can be secured by cities of from 10,000 to 20,000 inhabitants for from \$5000 to \$15,000.

According to the New York *Bulletin* the hazards of fire are nearly eight times greater in this country than they are on the Continent of Europe. While, for instance, the loss of the stock fire companies in Prussia averaged 12½ cents per \$100, those in the United States averaged 83½ cents. The yearly loss of fire here being calculated at \$75,000,000, it follows that if as much security could be attained as there is in Prussia, we should effect an annual saving of \$60,000,000. Shoddy in architecture doesn't pay any more than it does in clothing—or politics.

Special Notices.

AGENTS WANTED.

SPECIAL INDUCEMENTS.

We want a first-class agent in every county in the United States, and also in Europe, to sell the world-renowned *Wilson Sewing Machine* and *Wilson Manufacturing Company*, whom we are prepared to offer Extraordinary Inducements. For particulars, apply or address *Wilson Sewing Machine Co.*, 827 & 829 Broadway, N. Y.

Special Inducements to Exporters.

NOTICE

Is hereby given that goods for the exhibition at Diocjakarta, Dutch East Indies, (see *The Iron Age*, Nov. 12, first edit.) will still be in time if shipped by steamer ROTTERDAM, December 24th.

L. W. MORRIS, Agent,

Morris European Express,

50 Broadway, N. Y.

An iron worker of large experience in this country and Eng. and with the best testimonials as to character and capacity, wishes an engagement as manager or foreman of a mill or forge. Has had 20 years' experience in the manufacture of bars, hoops, plates, sheets, and puddle steel.

Address, **J. L.**, *Office of The Iron Age*, 10 Warren St., N. Y.

Office of The Iron Age, 10 Warren St., N. Y.

Patents secured in the United States and Europe, on the lowest terms and very

PROMPTLY,

by **A. V. BRIESEN**, Solicitor of Patents and Attorney at Law in Patent Cases.

258 Broadway, N. Y., cor. Warren St.

Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.

CASH ADVANCES made on CONSIGNMENTS without additional charge.

THE

Fletcherville Blast Furnace Co.

Manufacture

CHARCOAL PIG IRON,

Exclusively from New Bed Pure Magnetic Ore, suitable for Bessemer, Malleable and Car Wheel purposes, or for foundry use where very soft and strong iron is required.

Analysis of Average New Bed Pure Ore.

Metallic iron.....68.240 Undertermiated mat-

Oxygen with iron.....26.010 ter and loss.....134

Water.....380 Carbon.....1.019

Insoluble silicous Carbon.....3.821

matter.....4.320 Sulphur.....0.98

Sophorite, practically none Sulphur, practically none

Phosphorus.....0.98 Calcium.....1.10

Alumina.....280 Sulphur.....1.10

Lime.....140 Metallic iron.....94.838

Undertermiated mat-

ter and loss.....502 lime.....140

100.000

100.000

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|--------------------------------------|-------|--------|
| 10 tons cold blast, Hanging Rock.... | 52'00 | 4 mos. |
| 10 tons coal blast..... | 46'00 | 4 mos. |
| ANTHRAZIT. | | |
| 10 tons No. 1 foundry..... | 30'00 | 4 mos. |
| 10 tons No. 1 foundry..... | 28'00 | 4 mos. |
| BLOOMS. | | |
| 25 tons scrap..... | 26'00 | cash. |

CINCINNATI.

Measrs. L. R. HULL & Co., under date of Nov. 23, write us as follows: Pro IRON.—Market inactive and demand light. Sellers meet the demand freely, and there is some disposition to make concessions to effect sales of round lots. All grades share in the prevailing dullness. We quote:

| | |
|---|----------------------|
| HOT BLAST CHARCOAL. | |
| Hanging Rock No. 1, ton. \$30'00 @ 32'00-4 mos. | |
| No. 2..... | 27'00 @ 26'00-4 mos. |
| " " Forge..... | 25'00 @ 26'00-4 mos. |
| Tennessee No. 1..... | 25'00 @ 23'00-4 mos. |
| " " Forge..... | 28'00 @ 30'00-4 mos. |
| Alabama No. 1..... | 30'00 @ 32'00-4 mos. |
| Missouri No. 1..... | 30'00 @ 29'00-4 mos. |
| " " No. 2..... | 28'00 @ 29'00-4 mos. |

| | |
|------------------------|----------------------|
| HOT BLAST STONE COAL. | |
| Missouri No. 1..... | 32'00 @ 30'00-4 mos. |
| Forge..... | 30'00 @ 30'00-4 mos. |
| Ohio No. 1..... | 27'00 @ 29'00-4 mos. |
| " " Forge..... | 25'00 @ 26'00-4 mos. |
| Scotch Pig, No. 1..... | |

| | |
|--|----------------------|
| COLD BLAST CHARCOAL. | |
| Hanging Rock Car Wheel @ ton. \$26'00 @ 30'00-4 mos. | |
| Missouri..... | 43'00 @ 45'00-4 mos. |
| Kentucky..... | 40'00 @ 45'00-4 mos. |
| Tennessee..... | 38'00 @ 45'00-4 mos. |
| Georgia..... | 40'00 @ 45'00-4 mos. |
| Alabama and Forge..... | 40'00 @ 43'00-4 mos. |
| Machinery and Forge..... | 40'00 @ 45'00-4 mos. |
| Blooms..... | 75'00 @ 90'00-1 mos. |

LOUISVILLE.

Mr. GEO. H. HULL, under date of Nov. 23, writes us as follows: The market is dull and lower. The usual time, four months, is allowed on the quotations below:

| | |
|--|---------------|
| HOT BLAST CHARCOAL. | |
| No. 1 F'dry, from Hanging Rock Ores. \$20'00 @ 23'00 | |
| " 2 " " " 27'00 @ 28'00 | |
| " 3 " " 25'00 @ 26'00 | |
| 1 F'dry, from Tennessee Ores..... | 27'00 @ 30'00 |
| " 2 " " 26'00 @ 27'00 | |
| 1 Forge, " " 24'00 @ 25'00 | |
| 1 F'dry, from Alabama Ores. 27'00 @ 30'00 | |
| 1 " " Iron Mountain Ores. 30'00 @ 32'00 | |

| | |
|--------------------------------------|---------------|
| HOT BLAST STONE COAL. | |
| No. 1 F'dry, from Missouri Ores..... | 30'00 @ 32'00 |
| " 2 " " 28'00 @ 30'00 | |
| " 1 Forge, " " 27'00 @ 28'00 | |

BOSTON.

Nov. 21.—*Pig.*—There is a trifling improvement to be noticed—not particularly that the foundries are having a better business, but those which are employed seem to have dropped in during the week and taken up again, in the aggregate, 300 tons. There is no change in values. The stock on Fisk's wharf, held on storage by every house in Boston, is considered to be about 11,000 tons, and if a little flitter in trade occurs while navigation is closed, holders begin to discuss whether the present quotations 31c. @ 33c. for No. 1 and 28'50c. @ 31c. for No. 2 will not be advanced. It is a fact that there is no Coltness, Gartsherrie, or Glen-ganock in store here in Boston, and only 75 tons Eglington, which is offering at 83'9, while importers report none on the way. *Bar* still continues to sell in a fair way, the market being a little more settled on a 2½c. basis. There is considerable anxiety about the disposition of the poudlers' wages troubles at Pittsburgh, and some disposition to anticipate that the reduction will be accepted by the workmen. Several of our near-by mills have come in and offered bar at prices below the cost to land from Pittsburgh, counting the cost there at 82'40 @ 2'50, and 35c. freight to land at wharf. Four of the leading houses at the North end have arranged to locate among the South end dealers. This move will concentrate the heavy houses in the trade. *Steel* is in moderate inquiry, largely machinery, tool being rather more dull. Prices are steady for machinery at 9½c. @ 10c.; warranted American tool, 15½c.; choice English tool, 17c.—*Com. Bulletin.*

FOREIGN.

FRANCE.

(Monteur des Intérêts Matériels.)

PARIS, Nov. 8, 1874.—*Metal.*—The week under review has evinced more animation in the European Metal trade than has been witnessed for some time past, the result being a general strengthening of the market. In some departments an increased impulse has been given to the dullness, through the participation of the speculative element, although to be to a moderate extent. The speculative purchases have been unattended with excitement, bearing the results, apparently, of well meditated operations based upon the merits of the position of several metals. Such being the case, the amelioration effected in the value of some of them seems to respond to the general increase. The tendency in the London market has been productive of another important rise, more than the usual amount of activity prevailing. We can pronounce the statistical position in England a remarkably sound one, the stock of Chili Bars showing a further diminution of 1500 tons; the large deliveries there have exceeded the expectations of most people in the trade. The present strong position of the metal b'ds fair to continue, for the market will have a tendency to go on so steadily that they carry the confidence of every unblinded mind that consumption is fast outstripping production, and that the stock of Chili Bars will be pretty much exhausted should consumption proceed at the same rate for another three or four months. September was ushered in with an English stock of 17,300 tons, which had dwindled down to 15,300 a month later, to amount to but 12,700 Nov. 1. A report of 15,000 tons about the same stock as at present, when the market took a sudden start and ran up 20', while the condition of the trade is a great deal better now than what was the case then. What there remains afloat from Chili is nearly all sold. A proportionate rise in Chili, and consequently light charters, are expected. A bold operator can, under the circumstances, easily put up to market, the more so as some short sales seem to be uncovered. Our own market is held at the following quotations: Chili Bars, 22'50c. @ 23'50c.; medium brands, 7½ to 7¾; and Silesian, 7¾ to 8½. Breslau is firm at 7¾. Stettin bears up well at 8 to 8½.

HOLLAND.

(Koch & Vletterboom.)

ROTTERDAM, Nov. 3, 1874.—*Tin.*—The bears having been compelled to cover, the price of Banco has advanced to 57½ guilders; it is offering at 58. The next sale of Billiton Tin at Batavia will take place on the 14th proximo, and will comprise 9000 piculs. The following is the export movement of Tin from Holland, from official tables:

| | August. | Eight months. | |
|----------------------|-------------------|-------------------|--------|
| 1874. | 1873. | 1872. | |
| tons. tons. tons. | tons. tons. tons. | tons. tons. tons. | |
| Germany..... | 295'00 | 161'00 | 199'00 |
| England..... | 18 | 70 | 23 |
| Belgium..... | 203 | 36 | 134 |
| France..... | 44 | 6 | 34 |
| Hamburg..... | 51 | 8 | 22 |
| United States..... | .. | .. | 16 |
| Other countries..... | 114 | 33 | 8 |
| | 723 | 320 | 420 |
| | | 4,473 | 4,543 |
| | | 3,274 | |

We call attention to the German increase, but more particularly to the large quantity sent to Belgium. At the same time, the decrease to England is a noteworthy one.

EAST INDIES.

(Dummer & Co.)

BATAVIA, Oct. 7, 1874.—*Tin.*—There is nothing doing. On the 12th instant a sale of 17,000 slabs Billiton will take place. Export from Java to the Atlantic States to date, none, against 311 piculs in 1873. The English market is dull and the Australian have recently taken place, and further stocks are known to be on the way, which had the effect of depressing the market. A cargo of Best English has been sold, deliverable at Sourabaya, at 23 guilders, but the price is no more obtainable, and only 20 guilders is offered. No very recent sales of Australian have been made. *Exchange.*—During last month there are no purchases of English for sale, but rates were pretty steady. The price of English for England and Holland. Toward the end of this month the tendency was a little weaker, and on closing quotation is 11½ to 11½½ guilders £1 sterling, 6 months sight, London.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHIEFFIELD, Eng., Nov. 9, 1874.

THE STATE OF TRADE

is not very brisk in the iron departments, although some of its branches are by no means without an encouraging show of work on hand as well as fairly filled order books. The branches in this favored condition are not, however, at all numerous, being, in fact, limited to the armor plate, boiler plate, engineering and foundry works. Finished is not much sought after in any district or for any purpose. This state of things may be expected to grow still more pronounced as the end of the year draws nearer, it being a recognized merchants' rule not to give out more commissions than are absolutely of an imperative nature just before the closing of their books. Steel, too, does not move off any more readily than it did when I last had occasion to refer to it, and what is still more remarkable, the Bessemer steel departments are rapidly dwindling down in their production, some of the best Sheffield firms having difficulty to run that department more than two days weekly. In South Wales the works are almost inoperative, trade is dull, the men discontented, the ironmasters united in attempting reduction, and prospects generally about as hopelessly blank as is well possible.

EXPORTS FOR OCTOBER.

The full Board of Trade returns for October are not yet published, but I have an advance intimation that the total value of our imports for the month was £27,912,714, as compared with £21,647,715 in October, 1873. Our exports were £21,918,528, as against £22,341,239 in the same month last year. Taking the month of October separately, I find the following facts:

Expt'd in Oct. Against Oct. 1873.

Value of arms, ammunition, &c. £174,172 £153,573

Value of coals, coke, &c. £1,086,538 1,176,082

Value of iron and steel. £3,068,303 3,309,895

Value of steam engines. £31,391 250,651

Looking at the figures as the totals for the ten months ending October 31st in each year, I find the result as to quantities and values is thus:

| Article. | 1873. | 1874. | Value 1873. | Value 1874. |
|-------------------------------------|------------|------------|-------------|-------------|
| Coals, Coke and Patent Fuel, tons.. | 10,391,681 | 11,109,950 | £10 10s | £11 50s 3d |
| Copper, cwt.s. | 556,528 | 605,421 | 3 3s | 2,571,492 |
| Iron, Pig, tons. | 1,026,488 | 927,372 | 2,687,698 | 423 |
| Bar, etc., tons. | 906,114 | 826,498 | 3,014,511 | 3,014,511 |
| Railroad, tons. | 217,622 | 210,132 | 1,268,000 | 1,268,000 |
| Other kinds, tons..... | 665,409 | 705,537 | 5 1s 9d | 8,789,923 |
| Lead, tons..... | 617,724 | 502,957 | 14,341,578 | 12,400,763 |
| Tin, Unwrought, cwt.s..... | 27,501 | 32,533 | 751,110 | 427,717 |
| Machinery and Millwork..... | 90,991 | 41,747 | 8,916,227 | 8,243,674 |

SCOTCH PIG IRON MARKET.

The Scotch pig iron market was, in the main, firm all last week, and on the week there was a rise of fully 3½ per ton in the value of warants. In makers' brands there was a steady business, consequent upon which and the returns of the preceding week showing an increased shipment by 1-ton lots, Gartsherrie, 1 at 105'. Gleng

tin has greatly augmented, and several advances have been noted. Spelter continues firm; business has, however, been limited, owing to the paucity of lots offering. Lead remains unaltered, the difficulty of placing orders being as great as ever."

Messrs. French & Smith's circulars: "Copper.—A large consumptive demand during the past month has had the effect of considerably reducing available stocks, so that the monthly statistics show very favorably. The combined stocks here and abroad are now some 3000 tons less than at any time during the current year. This metal is attracting the attention of speculators, and for the last ten days transactions have been large at daily increasing values. We quote Chill bars, £27; Wallaroo, £26; tough, £21; regulus, 17/- per unit. Tin.—The price continued as at the beginning of October with but little variation until about a week since, when some considerable purchases, both spot and floating, especially of Australian, were made. As the quantity on the market was so much reduced, holders required higher rates, and when the stocks were made up, it was found that the deliveries were larger than at any former period, it was impossible to buy, excepting at an advance of £1 to £2 per ton. Australian is now quoted 10/- per ton lower than Straits. Tin plates.—There is improved demand for tin plates, and the works are getting more fully employed. Lead.—The smelters have great difficulty in making deliveries. The price is firm at £23 to £23.5%. Spelter has advanced, and is quite firm at present quotations. Quick-silver is difficult to buy; a small parcel was sold at £25 per bottle."

LATEST LIVERPOOL PRICES.

| IRON: f. o. b. in Liverpool, per ton. | | £ | s. | d. | £ | s. | d. |
|---------------------------------------|----|----|----|----|----|----|----|
| Merchant bar | 9 | 5 | 0 | 10 | 0 | 0 | 0 |
| Staffordshire bar | 8 | 12 | 0 | 9 | 0 | 0 | 0 |
| Hoop | 10 | 0 | 0 | 12 | 0 | 0 | 0 |
| Sheet | 11 | 10 | 0 | 12 | 0 | 0 | 0 |
| Nail rod | 13 | 0 | 0 | 14 | 0 | 0 | 0 |
| Bar, best crown | 10 | 5 | 0 | 10 | 15 | 0 | 0 |
| Boiler plates | 12 | 5 | 0 | 13 | 5 | 0 | 0 |

TIN PLATES: f. o. b. in Liverpool, per box.

| TIN PLATES: f. o. b. in Liverpool, per box. | | £ | s. | d. | £ | s. | d. |
|---|---|----|----|----|----|----|----|
| Charcoal, I. C. | 1 | 15 | 0 | 1 | 18 | 0 | 0 |
| Coke, I. C. | 1 | 7 | 6 | 0 | 1 | 10 | 0 |
| Bolt and Sheathing | | 93 | | | | | |
| Title | | 93 | | | | | |
| Tough cake | | 93 | | | | | |
| Best selected | | 95 | | | | | |

Meeting of Pig Iron Manufacturers.

At a meeting of a number of the pig iron manufacturers of the Lehigh Valley, held two weeks ago, the following conclusions were reached:

That the interests of those engaged in the manufacture of pig iron imperatively demands a further curtailment of production. To continue producing at the present rate, it was thought, is to invite and inflict on all engaged in the business serious loss, and on many certain financial ruin. It was agreed that all producers of pig iron ought at once to unite in mutual efforts to immediately reduce the output of the furnaces.

There can be no rational hope for any favorable reaction in prices, or in demand from consumers, before spring. Improvement will then, it is thought, be slow and gradual, even if our best hopes are realized. To go on, therefore, increasing the accumulation on the banks of the furnaces, it is feared, will tend to postpone and may wholly prevent such favorable reaction during next year.

To afford a living result at present cost of production, No. 1 Foundry should bring \$30, net, on furnace bank. There is good reason for believing that it would to-day command that price as readily as that now obtainable, but for the excess of production over demand for consumption. The present comparatively high price of Scotch pig would seem to warrant such a belief. The fact that sales of any magnitude can now only be made at a material loss to the producer, and this at a season of the year when demand is always greatest and prices usually highest, was thought to indicate that the demand for winter consumption would be small.

Those most experienced in the trade all agree in the opinion that we must now unite in efforts to immediately reduce the output of pig iron, or widespread disaster must result. All have a common interest at stake, and it is believed the future of the trade imperatively demands this action. Therefore, in furtherance of these views, a general meeting of the pig iron manufacturers of the Lehigh Valley, Schuylkill Valley, Upper and Lower Susquehanna, and of New Jersey, and such others as may attend, will be held at the rooms of the American Iron and Steel Association, No. 265 South Fourth Street, Philadelphia, on Tuesday, Nov. 24th, 1874, at 10 o'clock a. m., to which you are respectfully invited.

It is earnestly to be hoped that a full attendance will result. Otherwise the meeting must fail of its aim. Those who previous engagements make it impossible for them to attend, should present their views to the meeting by letter.

In response to this call a meeting was held yesterday (Nov. 24th) at the rooms of the Iron and Steel Association, of which we have the following report:

(By Telegraph to the Iron Age.)

PHILADELPHIA, Nov. 24th, 1874.

To the Editor of the Iron Age.—A large meeting of pig iron manufacturers was held to-day at the rooms of the American Iron and Steel Association, Mr. G. Dawson Coleman in the chair, and Mr. Geo. W. Cope acting as Secretary. Among those present were Messrs. Wm. Harvey, C. S. Kaufman, Horace Brooks, James I. Bennett, Samuel J. Reeves, W. E. S. Baker, Percival Roberts, J. B. Moorhead, and others. Over thirty furnace companies were represented. A full and free exchange and comparison of views resulted in the adoption of the following resolutions.

Resolved, That it must be self-evident to all furnace owners, that the large reduction in the demand for consumption of pig iron imperatively demands a corresponding reduction in the amount produced, and that a continuance of the present over-production cannot fail to result in accomplishing the ruin of the trade.

Resolved, That it is the opinion of this meeting that an earnest effort ought to be immediately made to accomplish a reduction in the

make of pig iron, and with this object in view, a committee of seven be appointed to devise some plan to accomplish that end.

Resolved, That the chairman *pro tem* of the pig iron branch of the American Iron and Steel Association be requested to call a meeting of all the pig iron manufacturers of the country, at the rooms of the Association, on Thursday, December 10th, 1874, at eleven o'clock.

The committee of seven was constituted as follows: Wm. H. Alvery (P), C. S. Kaufman, G. Whittaker, J. B. Moorhead, G. D. Coleman, Horace Brooks and H. S. Eckert. The committee will meet at the rooms of the Association on the evening of Wednesday, the 9th of December, for further consultation, and on the following day they will present their plan for curtailing the production for the action of the meeting to assemble in accordance with the resolution above passed. The utmost harmony prevailed throughout the proceedings, and the opinion was unanimously expressed that nothing but the blowing out of a good part of the furnaces now in blast can avert worse disaster than has already overtaken the pig iron interest.

Blast Furnace and Rolling Mill Enterprise in Texas.

A company is now organizing in the town of Sherman, Texas, for the purpose of erecting a blast furnace and rolling mill, for the manufacture of pig iron, nails, &c. We take pleasure in laying before the public the inducements and advantages this company offers to capitalists and others seeking safe and paying investments.

The deposit of ore this company proposes to work is found on a tract of land containing 400 acres, more or less, situated ten miles northeast of Sherman, Texas, three miles north of the Trans-Continental Railroad, six miles east of the Houston and Texas Central Railroad. Three kinds of ore are found on this land; the gray and the brown and red hematite ores.

Three different analyses, made from different samples of this ore, show the average yield of metallic iron to be 39.5%. This shows a much larger yield of iron than the majority of ores used in Pennsylvania. Her iron manufacturers have grown rich by working ores that only yield from 20 to 25, 27, 30, 35 and 37 per cent. But one deposit of ore in the State of Pennsylvania yields as much as 48 and 50 per cent.; that is known as Cornwall mountain.

The secretary of the company thus describes the plan of its intended operations:

For the development of this great source of wealth, we require energy and capital. We propose to organize a joint stock company, with a capital stock of \$225,000, for the purpose of erecting a blast furnace and rolling mill, for the manufacture of pig iron, nails, &c. We claim that pig iron and nails can be made at the following profits: \$225,000 would erect a blast furnace with a capacity of fifteen to eighteen tons per day, and a rolling mill with a capacity of 250 kegs of nails per day. Statistics show that this amount of nails would supply about one-seventh of the nails consumed in the State of Texas.

COST OF PRODUCTION, AND PROFITS.

Men of forty years' experience in the iron business who have examined this deposit of ore and its surroundings, say they can make pig iron for \$18 per ton; to be certain, say it will cost \$23, or \$5 more than they estimate. This pig iron (charcoal) is worth in St. Louis, \$36 per ton, showing a profit of \$13 per ton, or a profit of \$195 per day for the blast furnace. Now we propose to use this pig iron here; turn it over to the rolling mill at \$36 per ton. The mill rolls the 15 tons each day into bars and cuts it into nails. We will now see what they have accomplished at the end of each day. The pig iron cost \$36 per ton; say the loss is 200 pounds per ton, that would leave 1800 pounds, or make 18 kegs of nails, worth on an average \$4 per keg in St. Louis. Freight to any portion of Texas is \$1 per keg from St. Louis, consequently each keg would be worth \$5 here. That would make \$90 for each ton of iron so worked up, and shows a profit of \$54 per ton, or \$815 on 15 tons, on one day's work. This added to the profits of the furnace shows a profit of \$1005, less the labor, fuel and incidental expenses of running the rolling mill. We have made a calculation in regard to the cost of labor, fuel, etc., which, at a liberal estimate, cannot exceed \$400 per day, leaving \$605 as a daily profit on the investment, or a clear annual profit of \$189,365.

SURROUNDINGS.

With such a deposit of wealth in our very midst, what more could we ask? Every element necessary to make pig iron, nails, castings of all kinds, is contained on this same ground. Limestone of a superior quality, necessary for the flux, is found in large quantities immediately under a portion of the red hematite ore, and inexhaustible quantities could be had within two or three hundred yards of the probable location of the furnace. Sandstone is also found close by, suitable for the furnace. Timber—the entire tract is covered with heavy timber, principally post oak and hickory, as well as the surrounding country, for ten or fifteen miles, guaranteeing a sufficiency of timber to make charcoal to run a blast furnace and rolling mill for fifty years. Four never failing springs are on this land; either of them would furnish water enough for steam purposes. The Choctaw Creek, a never failing stream, runs along two sides of this land.

The quality of ores on this land will, with a proper mixture, make Bessemer steel rails, car wheels, or anything else made from iron ore. The reason we selected nails as an illustration is that they are used by everybody; are as staple as gold, and always command a ready market. The long lines of transportation to this country will always be necessitated to charge high rates of freight, as they are doing. Labor is as cheap here as in any manufacturing

district we know anything about. The best of colored labor can be procured here for one dollar per day. Subsistence of all kinds is equally as cheap, consequently our facilities for making cheap iron are equal to any iron field in America. Nowhere are there more favorable inducements held out to the capitalists than here in this enterprise, in the development of our iron interest, and the future of our great State of Texas.

Lake Superior Iron and Copper.

The following figures, taken from the Marquette Mining Journal, show the iron and copper shipments for the season ended Nov. 12th, 1874:

| ORE. | | |
|---------------|---------|---------------|
| Cleveland | 88,237 | New York |
| Lake Superior | 78,579 | Shenango |
| Champion | 46,656 | Rolling Mill |
| Washington | 23,186 | Edwards |
| Republic | 112,647 | Winthrop |
| Keystone | 3,039 | McComber |
| Kloman | 31,730 | Lake Angelina |
| | | 610 |
| Total | 411,325 | |

| PIG IRON. | | |
|----------------|--------|-----------------------|
| Mich. Iron Co. | 8,284 | Carp Furnace |
| Morgan Furnace | 6,873 | Iron P. Furnace |
| Bacroft | 3,261 | Iron Cliff P. Furnace |
| Champion | 4,088 | Rolling Mill |
| Grae | 4,037 | |
| Total | 21,794 | |

| SHIPPED PAST WEEK. | | |
|--------------------|-------|----------|
| Iron ore | 5,383 | Pig Iron |
| Total | 5,670 | |

GRAND ISLAND.

The following are the shipments, in gross tons, of pig iron, from the Grand Island furnaces this season, up to November 12:

| Bay Furnace. | | |
|--------------|------------------|-------|
| 7,068 | Munising Furnace | 5,113 |

| Total | | |
|--------|--|--|
| 12,181 | | |

ESCANABA.

The following table exhibits, in gross tons, the shipments from Escanaba for this season, up to and including November 11, 1874:

| ORE. | | |
|---------------|--------|--------------|
| Jackson | 82,187 | Mill Lake |
| New York | 54,029 | Planing Mill |
| Cleveland | 6,236 | Salisbury |
| Lake Angelina | 26,456 | Foster |
| Barnum | 36,463 | P. & L. S. |
| Cascade | 7,257 | Home |
| Winthrop | 1,338 | Goodrich |
| Saginaw | 39,555 | Excelsior |

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A Visit to Coalbrookdale.

Coalbrookdale is very intimately associated with all that is interesting to dealers in iron and iron goods of almost every kind. Attracted, no doubt, as they usually were, by the outcropping of the ore and the abundance of timber, the Romans smelted iron there, and the tributaries of the Severn coming down the steep embankments of the neighborhood afforded motive power for the blast engines and the hammer.

That cutlery was made here even as far back as the beginning of the thirteenth century would seem to be indicated by the existence of an old tenure, dated 13th John, 1211, which showed that the tenant of the king at the More, within the jurisdiction of the Sheriot forest, held his land upon the condition that he appeared at the Exchequer on the feast of St. Michael yearly with a hazel rod of a year's growth and a cubit's length, and two knives (*cultellus*). The treasury and barons being present, the tenant (Mr. Randall) informs us in his very interesting book entitled "Old Sports and Sportsmen"), was to attempt to sever the rod with one of the knives until the blade bent or broke.

The other knife was to be of a very different class, inasmuch as it was with one stroke to sever the hazel rod. The quality of the cutlery being thus established, this last knife was to be given up to the king's chamberlain for royal use. Why His Majesty should have desired to encourage the manufacture of inferior as well as first-class cutlery in Coalbrookdale is not quite clear. Were there Cheap Johns in those days? If so, perhaps, His Majesty had a notion of encouraging trade in "cheap and nasty." Of the origin of the tenure nothing is really known but it is supposed to have arisen out of some kingly peril or some other forest incident connected with the chase. Nevertheless, it is conclusive that cutlery was made in the Coalbrookdale district at least six and a half centuries ago. That iron was manufactured at a very early period in the heart of the forest of Sheriot and the Clee is shown by Leland, who informs us that in his day there were blow shops on the Brown Clee Hills in Shropshire, where iron ores were exposed upon the hillsides, and where, from the fact that wood was required for smelting, it is only reasonable to look for them. Historical records and monastic writings, as well, will have been seen, as old tenures, together with traditions, and heaps of slag, tell us that iron had been manufactured in the midst of these woods from very remote periods.

There were predecessors of the present Coalbrookdale Company as far back as the reign of Henry VIII. Since that time the Dale is identified with almost every epoch in the history of iron manufacture and its adaptation to the requirements of modern life. Richard Ford, who married a daughter of Abraham Darby, and managed the works in 1747, was the first to successfully use at about that time raw coal in the process of iron smelting; and there were the brothers Cranege, foremen to Richard Reynolds, who succeeded the second Abraham Darby, that were the first in 1768 to use raw coal to make bar iron out of cast iron in a reverberatory furnace. The era of railroads, too, was fairly initiated at Coalbrookdale, when Reynolds replaced the wooden rails with rails of cast iron. It was to Abraham Darby the third to whom the world was indebted for the first iron bridge ever erected. The cast iron arch was prepared under the superintendence of Abraham Darby by Mr. Thomas Gregory, his foreman of pattern makers. The castings were made at the Coalbrookdale foundry, and the iron work was successfully erected in the course of three months. The bridge was opened for traffic in 1779, is sound at the present day, and has given rise to the thriving town of Ironbridge, on a spot which was previously a nameless part of the waste of the Manor of Madeley. Later on, Mr. John Wilkinson, when he launched the first iron barge, made Coalbrookdale the cradle of the iron shipbuilding trade.

What the Coalbrookdale Company have done in fine art metal work, the frequenter of either the 1851 or 1863 exhibitions well remembers; and every ironmonger is aware in how large a degree the concern contributes to the supplies of the market with first-class cast iron products for both use and ornament. When we visited the works a few days ago, we found all these in different stages of manufacture.

The antiquity of the concern was illustrated by a bar, dated 1685, of one of the old charcoal blast furnaces that once stood at Longwood. This, when the furnace was dismantled, had been preserved, and now stood parallel with the bar of a later furnace which had been erected on ground that is, at the present time, a casting shop. On this second bar was the date 1777. It had belonged to that furnace which was destroyed, with much other property, on the occasion of the land flood of the Dale, recorded in the "Philosophical Transactions" of the time, and respecting which much joy was manifested by the Darbys that though many thousand pounds worth of property had been lost, yet that there was no sacrifice of life. Nor has water-power been altogether abandoned at the Coalbrookdale Works. It was being used to actuate lathes and other working apparatus. Whilst, however, processes adopted by the able fellows who did so well and so bravely in devising means of manufacture without having precedent to guide them were being here and there continued, simply because further experience has not yet developed anything more perfect, still that which more extended knowledge and science has supplied we found here in complete operation, both in the early casting processes, and likewise in the later operations through which the hardware had of necessity to pass. There was no part of the concern which did not seem to be in nearly full work, and we learned that this had been the case all through the recent depression. The

extent of the company's engagements is to be inferred from the fact that, including the pitmen, employment is afforded to some 3000 hands. It may here be said that, to secure an uninterrupted supply of fuel, colliery in North Wales has lately been acquired by the company. This rendered the firm independent of the stoppage of local pits during the strike, not long since, of the colliers.

Very interesting was it to see the wares with which one is so familiar from day to day in their complete shape, in their embryo condition. Strangely weird, and reminding one somewhat of the remains in the Naples Museum of ancient Romans who fell beneath the Vesuvius lava storm which buried Pompeii and Herculaneum, were the limbs of a Naiad as they lay imbedded in the foundry mold, but which, when they have passed through the other stages awaiting them, will present an elegant and smoothly chiselled figure supporting a water fountain, hereafter to grace the demesne of a British noble. Clean and sharp, even when they left their foundry matrix, were the castings that will by-and-by find a place both within and without doors, to the delight and the comfort of both young and old of all social grades. Nor could we fail to be slightly admonished, as we presently saw some of them being worked up into tomb rings of different sizes and varied designs. One was not surprised to see how large had been the provision which was made for the manufacture of stove grates. The store of fire brick backs and sides would have required several of Wilkinson's iron barges to convey it up the river. Two dozen grinding stones required for brightening stove grates were kept going by a powerful vertical engine worked by expansion, and possessing all the modern improvements. Very numerous were the different classes of grates in course of manufacture, and ingenious the contrivances for economizing fuel and the application of tiles to the sides of grates for purposes of ornament and as reflectors. The newest grate in hand was that by Whitwell, somewhat upon the Captain Galton system of admitting cold and emitting hot air. It was small and compact, and it was claimed for it that it is much more economical of fuel than the Galton

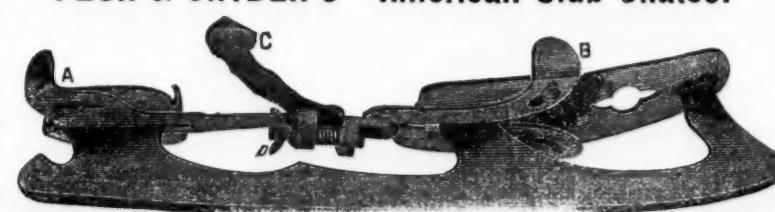
Electro-bronzing was being extensively applied. There is scarcely any kind of ornamental cast iron ware to which, indeed, it could not be adapted with great advantage. Upon nothing, however, was it observed with more gratification to the spectator than amongst the lighter class of articles—plates which can be used either for receiving address cards or for holding fruit. Quite new, however, was its application to devices of about the size of painted tiles for grates. There were two specimens at the works, each having a grouped device from an old master. The slabs were of iron, and the figures were brought up in bold relief and suitably bronzed. One slab, with a horse and his driver, after Albert Durer, was a delightful piece of art, and embraced an illustration of foreshortening which we have never seen surpassed. Such work and such designs might be adapted with striking effect to the sides of stove grates; but in nothing would they appear to greater advantage than in massive mantle pieces electro-bronzed. It did not appear that the Coalbrookdale Company have yet resolved to apply the medallions to any structure. At present those we have described are mere indications of what their designers and artificers are capable of in that branch of their fine art work.

In promoting the study of the fine arts and the sciences among their work people, the Coalbrookdale Company have an institute embracing, amongst other attractions, a school of art, and during our visit we inspected very creditable specimens of free hand and mechanical drawing by young fitters and other such workmen in the company's service. Here, too, it may be remarked that near to the institute there stood a noble church, which the company have put up for the religious education of their employees.

In conclusion, I may note that, whilst by keeping themselves abreast of their competitors in Scotland and elsewhere throughout their miscellaneous departments, the Coalbrookdale Company are able to keep their old customers and extend their connection, they seem to have a growing demand for massive machinery. This is to be inferred from the fact that a spacious new fitting shop is being put up. From what we observed in course of erection in this shop, it is clear that Mr. Norris, the manager, intends keeping abreast of the times in this department also. A planing machine was being laid down of the unusually large dimensions of 20 feet by 8 feet, with three tools to operate together on two sides and the top of the work. A radial drilling machine has likewise been erected in the same shop.—*The Ironmonger.*

Arrangements are being made to build a shop in Youngstown, O., for the construction of iron bridges.

PECK & SNYDER'S "American Club Skates."



FOR LADIES, GENTLEMEN OR BOYS.

We manufacture the following sizes, which, in ordering, must correspond with the length of the shoe worn: 8—9—9½—10—10½—11—11½ inches. These Skates are made of the best material and in the best manner, requiring no Heel Plates or Keys, and are composed of Extra Strong Steel, and are now in market. Adjust the clamps A and B to the size of the foot by turning the thumb-screw D, when once adjusted, close the lever C, and the skate becomes securely locked to the foot.

Price, with Blued Foo-Plate, per Pair. \$3.75 Full Polished. Nickel Plated. \$3.40 \$3.25 \$3.50

The Clipper Club Skates, per Pair. \$3.60

We are also manufacturers of Straps and Skate Trimmings of every description.

Agents for Winslow's Wood Top Skates. Trade catalogue with discount on application, Address PECK & SNYDER, 126 Nassau Street, New York.

London Metal Market.

(From The Mining Journal.)

| Copper—per ton. | £ | s. | d. | £ | s. | d. |
|----------------------------|-----|----|----|-----|----|----|
| Best Selected. | 95 | 0 | 0 | — | — | — |
| Tough Cake & Tile. | 98 | 0 | 0 | — | — | — |
| Sheathing and Sheets. | 97 | 0 | 0 | 100 | 0 | 0 |
| Boats. | 100 | 0 | 0 | 108 | 0 | 0 |
| Bottoms. | 100 | 0 | 0 | — | — | — |
| Old. | 95 | 0 | 0 | 87 | 0 | 0 |
| Australian. | 96 | 0 | 0 | 96 | 0 | 0 |
| Wire. | 2 | 0 | 1 | 0 | 0 | 0 |
| Tubes. | 0 | 1 | 2 | 0 | 1 | 0 |

Brass—per ton.

| | | | | | | |
|------------------------------|---|---|----|---|---|-----|
| Sheets. | 0 | 0 | 9½ | — | — | — |
| Wire. | 0 | 0 | 9½ | — | — | — |
| Tubes. | 0 | 0 | 12 | — | — | — |
| Yellow Metal Sheathing. | 0 | 0 | 8½ | 0 | 0 | EX. |
| Sheets. | 0 | 0 | 8½ | 0 | 0 | 8½ |

Spelter—per ton.

| | | | | | | |
|---------------------------|----|----|---|----|---|---|
| Foreign on the spot. | 24 | 0 | 0 | 24 | 5 | 0 |
| " to arrive. | 23 | 15 | 0 | 24 | 0 | 0 |

Zinc—per ton.

| | | | | | | |
|------------------------------|----|---|---|----|---|---|
| In Sheets. | 3 | 0 | 0 | 31 | 0 | 0 |
| Quicksilver—per bottle. | 25 | 0 | 0 | 25 | 0 | 0 |

Tin—per ton.

| | | | | | | |
|-------------------------|-----|---|---|-----|---|---|
| English Blocks. | 99 | 0 | 0 | — | — | — |
| English Bars (br.) | 99 | 0 | 0 | — | — | — |
| Ditto Reined. | 100 | 0 | 0 | — | — | — |
| Barca. | 98 | 0 | 0 | 100 | 0 | 0 |
| Straths. | 94 | 0 | 0 | 95 | 0 | 0 |

Australian.

| | | | | | | |
|-------------|---|---|---|---|---|---|
| Wire. | 2 | 0 | 1 | 0 | 0 | 0 |
| Tubes. | 0 | 1 | 2 | 0 | 1 | 0 |

Brass—per ton.

| | | | | | | |
|------------------------------|---|---|----|---|---|-----|
| Sheets. | 0 | 0 | 9½ | — | — | — |
| Wire. | 0 | 0 | 9½ | — | — | — |
| Tubes. | 0 | 0 | 12 | — | — | — |
| Yellow Metal Sheathing. | 0 | 0 | 8½ | 0 | 0 | EX. |
| Sheets. | 0 | 0 | 8½ | 0 | 0 | 8½ |

Sheets—per ton.

| | | | | | | |
|---------------------------|----|----|---|----|---|---|
| Foreign on the spot. | 24 | 0 | 0 | 24 | 5 | 0 |
| " to arrive. | 23 | 15 | 0 | 24 | 0 | 0 |

Zinc—per ton.

| | | | | | | |
|------------------------------|----|---|---|----|---|---|
| In Sheets. | 3 | 0 | 0 | 31 | 0 | 0 |
| Quicksilver—per bottle. | 25 | 0 | 0 | 25 | 0 | 0 |

Tin—per ton.

| | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| English Bars. | 99 | 0 | 0 | — | — | — |

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The Best
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Send at once for a new
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The most complete ever published, containing Cuts and Prices of
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This Brace has a Light
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Malleable Iron

Cast Steel Jaws,
It is beautifully
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In places where there is not
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without the Ratchet attach-

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room to revolve the sweep,
They cost only 50 cents more
and will surely come

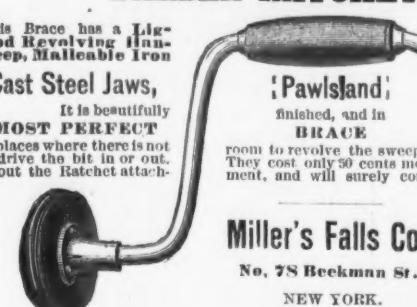
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Nut & Socket, with
Ratchet Wheel.

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slight back and forth motion
than the same style of brace
into general use.
For sale by all Hardware
Dealers.

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This is the most powerful Cutter in use, and
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by shipbuilders, manufacturers, and all others having
iron to cut. It will cut iron twice as large as
any other machine of the same cost.

Weight. Cuts. Price.
No. 1, 10 lbs., $\frac{3}{4}$ x 3 in., or $\frac{1}{2}$ in. round or sq. \$25.
No. 2, 165 lbs., $\frac{3}{4}$ x 3 in., or $\frac{1}{2}$ in. " " " 50.
No. 3, 312 lbs., $\frac{3}{4}$ x 4 in., or $\frac{1}{2}$ in. " " " 75.



Miller's Falls Co.,
No. 78 Beekman St.,
NEW YORK.

WITH THIS
BRACKET SAW

An infinite number of
useful and ornamental
articles can be made.
It will pay for itself
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The frame is 5x12 in.,
and made of red cherry
wood, beautifully polished.
For sale at all Hard-
ware stores.

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GLASS CUTTERS.

Our Glass Cutters are made with a handle like a Glazier's
Diamond, but, instead of the diamond point, they have a
hardened steel revolving wheel, the sharp edge of
which cuts nearly as well as a diamond. They are durable,
and will give entire satisfaction.

MILLERS FALLS CO., 78 Beekman St., N. Y.
Manufacture Barber's Bit Braces, Miller's Falls Vises, Little Giant Iron Cutters,
Adjustable Chuck Breast Drills, Family Tool Chests, Pratt's Boiler
Tube Scrapers, Patent Angular and Ratchet Drilling
Machines, Langdon Mitre Boxes.

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These Vises are only manufactured at the **HOWARD IRON WORKS**, at Buffalo, N. Y., and are so stamped. The improvements in these Vises
which are patented are valuable, and parties who claim to manufacture, and are offering a Vise representing it to be the same as the **HOWARD VISE**
are deceiving the Trade.

The Fisher & Norris Eagle Anvil Works.

(ESTABLISHED 1843.)



These Anvils are manufactured at the oldest Anvil Factory in this country.
They are superior to the best English, or other Anvils, on account of the peculiarity
process of their manufacture (invented and used only by this concern), and from the
quality of the materials employed.

The best English Anvils, after a time, become hollowing on the face by continued
hammering in use, on account of the fibrous nature of the wrought iron—causing it
to "settle" under the face.

The body of the Eagle Anvils being of crystallized iron, no such settling can
ever occur; and the cast face therefore remains perfectly true. Also, it has the
great advantage of being held in a more solid and compactly built base, less re-
bound, the pieces being forced to receive the full effect of the hammer, instead of a
part of it being wasted by the rebound, as with a wrought iron anvil. An
equal amount of work can, therefore, be done on this Anvil with a hammer one fifth
lighter than that required when using a wrought iron anvil which is more elastic.

The working surface is in one piece of Jessup's Best Tool Cast Steel, which,
after being accurately ground, is hardened and given the proper temper for the
heaviest work. The horn is covered with and its extremity made entirely of steel.
The body of the Anvil is of the strongest grade of American iron, to which the cast
face is warranted to be thoroughly welded and not to come off.

REDUCED PRICE LIST. ANVILS weighing 100 lbs. to 800 lbs., 11c. per lb.
Smaller Anvils, ("Minims.")
No. 0 1 2 3 4 5 6 7 8 9
Weighing about 10 lb. 15 lb. 20 lb. 20 lb. 40 lb. 50 lb. 60 lb. 70 lb. 80 lb. 90 lb.
Price, \$3.50 \$4.25 \$5.00 \$5.50 \$7.50 \$9.00 \$9.50 \$10.00 \$10.50 \$11.00

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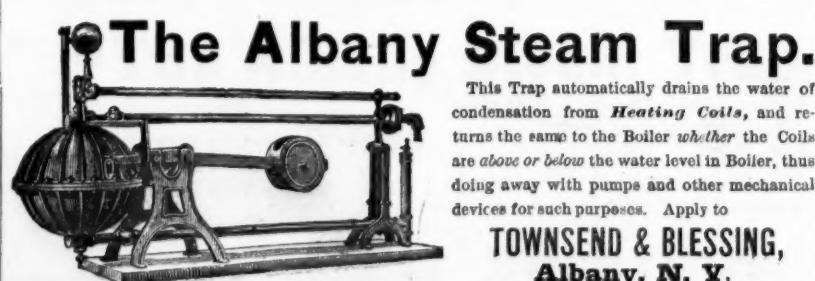
OAK BELTING,

Also, Picker or Moccasin Leather, for Boot and
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Angular Belting and Pulleys made to order.

PAWTUCKET, R. I.

MARK. Ask for Star Stamped Lace Leather.

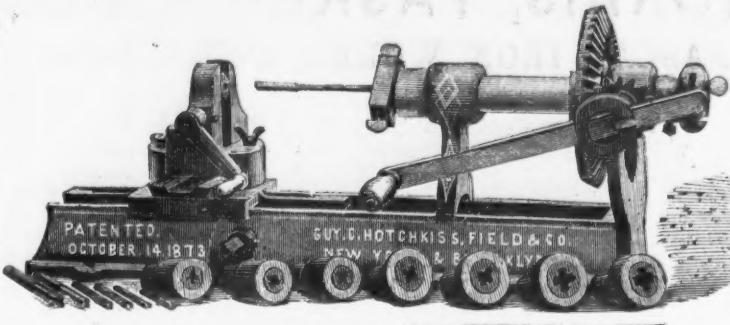


This Trap automatically drains the water of
condensation from **Heating Coils**, and re-
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doing away with pumps and other mechanical
devices for such purposes. Apply to
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and Nut Tearing Machine.

This machine has revolving and sliding jams, which enables the operator to cut all kinds work, no matter how irregular in shape it may be. It cuts a perfect thread at once going over. As much work can be done in one hour by this machine as in a day with stocks and dies. Send for Circular.

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DOVER EGG BEATER.

Special Notice to the trade.

The long contested suit (more than two years in court) Monroe vs. Dover Stamping Co., which was brought to **destroy the DOVER EGG BEATER PATENT**, has been decided in our favor (see decision of the Circuit Court of the United States, Sept. 3, 1871, Shepley, Judge), thus ending disastrously to our opponents, and fully vindicating the integrity of the Dover Egg Beater Patent, which we shall maintain legally against all who infringe the same or either of our seven other patents on Egg Beaters. **Imitations of our DOVER EGG BEATERS** or other of the Egg Beaters covered by our Patents, manufactured beyond the limits of the United States, and brought here for sale, will be promptly and severely dealt with.

All persons are cautioned against buying, selling or using such Infringements, as we shall prosecute all concerned in the illegal practice. We have already commenced suits to suppress the manufacture and sale of the so-called **EVERLESS BEATER**, and shall require all who infringe our rights to answer legally for their acts.

Remember that buying and selling as well as manufacturing any infringement of our Patents exposes one to three times the damages awarded by a jury.

The genuine Dover Egg Beater has its name "DOVER EGG BEATER" legibly cast on the face of DOVER STAMPING CO.



Sunny Side Stove Polish.

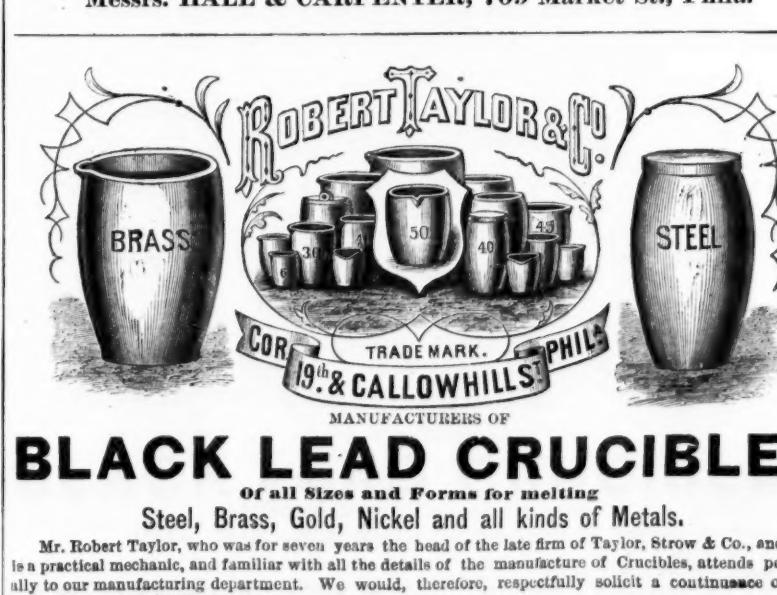
Lumber Pencils, Foundry Facings and Lubricating Plumbago.

STROW, WILE & CO.,

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GENERAL AGENTS:

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BLACK LEAD CRUCIBLES

of all Sizes and Forms for melting

Steel, Brass, Gold, Nickel and all kinds of Metals.

Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

ROBERT TAYLOR & CO.,

No. 1900, 1902, 1904 & 1906 Callowhill St., Philadelphia.

MERCHANT & CO., 507 Market Street, Philadelphia.

General Agents. PARK & CO., 122 Second Avenue, Pittsburgh, Pa.

Pipe, Fittings, &c.

Thomas T. Tasker, Jr.

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MORRIS, TASKER & CO.,

PASCAL IRON WORKS, Philadelphia,

TASKER IRON WORKS, New Castle, Del.,



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MANUFACTURERS OF

WROUGHT IRON WELDED TUBES.

Plain, Galvanized and Rubber-Coated, for Gas, Steam and Water.

Lap-Welded Charcoal Iron Boiler Tubes.

Oil Well Tubing and Casing, Gas and Steam Fittings, Brass and Steam Fitters' Tools, Cast Iron Gas and Water Pipe, Street Lamp Posts and Lanterns, Improved Coal-Gas Apparatus, Etc.

Ecton Mills Genuine London TURKEY EMERY.

ABBOTT & HOWARD, Agents for the United States.

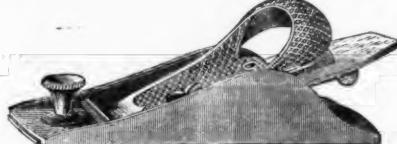
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BAILEY'S PATENT ADJUSTABLE PLANES.

Thirty different styles in

IRON AND WOOD.

80,000 ALREADY IN USE.



Carpenters, Cabinet Makers, Car Builders, Carriage Makers, Millwrights, Wheelwrights, All Use them.

Manufactured by the STANLEY RULE & LEVEL CO., Factories: New Britain, Conn. Wareroom: 35 Chambers Street, New York.

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| Machine Forged Nuts, | Magnetic Tack Hammers, Carriage Steps, |
| Hot Pressed Nuts, | Common and Patent Slat Irons, |
| Wrought Iron Washers, | Wood Choker Mouse Stump Joints, |
| Tin Washers, | Traps, |
| Carriage Bolts | Elastic Base Knobs, |
| Machine Bolts | Steak Hammers, |
| Flow Bolts. | Boxwood Rules, |
| Stove Bolts, | Ivory Rules, |
| Elevator Bolts | Plumbs and Levels, |
| The Bolts, | Adjustable Plumbs and |
| Fancy Bolts, | Ox Bow Pins, |
| Bolt Ends, | Levels, |
| Couch Screws, | Pocket Levels, |
| Turn Buckles, | Wagon Jacks, |
| Blacksmiths' Hammers. | Axle Clips, |
| Riveting Hammers, | Saddle Clips, |
| Machinists' Hammers, | Fifth Wheels, |
| Carpet Hammers, | Shaft Couplings, |
| | Yellow Plates, |
| | Magnetic Tack Hammers, Carriage Steps, |
| | Common and Patent Slat Irons, |
| | Wood Choker Mouse Stump Joints, |
| | Traps, |
| | Elastic Base Knobs, |
| | Steak Hammers, |
| | Boxwood Rules, |
| | Ivory Rules, |
| | Plumbs and Levels, |
| | Adjustable Plumbs and |
| | Ox Bow Pins, |
| | Levels, |
| | Pocket Levels, |
| | Wagon Jacks, |
| | Axle Clips, |
| | Saddle Clips, |
| | Fifth Wheels, |
| | Shaft Couplings, |
| | Yellow Plates, |

The "EMPIRE" Fan Blowing Portable Forges,

With or without Hood.

(Patented Nov. 25, 1873.)

WITHOUT BELTS OR BELLOWS.

It is more easily worked, gives a better blast, and is the cheapest forge made.

IT HAS NO BACK DRAUGHT.

Manufactured by W. P. KELLOGG & CO., Troy, N. Y.

Also CURRY COMBS, BORING MACHINES, & COOLEY'S WHIP RACKS, ETC.

N. Y. Depot for CURRY COMBS, ETC., with F. WIEBUSH, 84 Chambers Street.

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Pipe, Fittings, &c.

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Best Quality Lap Welded Iron Boiler Tubes,
STEAM AND GAS PIPE,Artesian Oil and Salt Well Tubing and Casing,
With Patent Protecting Coupling;

Mack's Patent Injector for Feeding Boilers.

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For STEAM, WATER and GAS.

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WROUGHT IRON PIPE
FITTINGS, BRASS & IRON VALVES & COCKS
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FOR HIGH & LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

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Sole Agency for the Pacific Coast for

Regester's Patent Gauge Cocks,
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Also,

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LUBRICATOR,

Warranted the most

reliable and durable

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CAST IRON PIPES

FOR WATER AND GAS.

Branches Retorts, &c.

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WHEATCROFT'S
SELF-ADJUSTING PIPE WRENCH.

Forged from Best Tool Steel.

The dog is solid over the head of the lever bar, taking the strain off from the pin.

Each Wrench takes four Sizes of Pipe.

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STEAM VALVES,

Iron and Composition, of all sizes.

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WATER and GAS Gates, 3 to 48 inches.

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TURNED MACHINE SCREWS.

One-sixteenth to five-eighths diameter.

Heads and points to sample.

IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

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**The Perfect Comb.**

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments with a view to meeting the requirements of a Perfect Comb. It is better, stronger and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz., a firm and safe hold for the comb in any position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never before attained, and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: The Perfect Comb.

THE LAWRENCE COMB CO.

Factory and Office,

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WILLIAMS WHITE & CHURCHILL,

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Builders' Hardware,
Locks, Hinges, Hooks and Staples,
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Also, Race & Mathews' Patent Hydrant. This Hydrant is perfectly anti-freezing, is the most ornamental and the cheapest made.

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**THE HOME CORN SHELLER.**

The best hand sheller for family use in the market.

Every Machine Warranted.

Price, \$2.50. Every Farmer and Poultry Raiser needs it.

Liberal discount to Hardware Trade.

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H. HOWSON, Solicitor of Patents. | C. HOWSON, Attorney at Law.

Communications should be addressed to the

PRINCIPAL OFFICES PHILADELPHIA.

The Influence of Scarce Labor upon the Prices of English Hardware.

In not a few branches of the hardware industries all sorts of allurements are being held out by employers and managers to attract men. We do not say that they are dishonorable allurements. On the contrary, so far as we are aware, only that is being done which is most honorable. One master is not enticing away the men of another, though the high wages offered are without precedent in our experience. The offers, however, are hardly more than nugatory in their consequences. The smiths' hearths that in the past two months have been put out, and the benches which have been made tenantless, both alike by natural mortality, remain so still, and are likely to so remain. Do what they will employers cannot get hands enough. Those who need more smiths, or safe makers, or lock makers, or iron plate workers, or tin plate workers, cannot get them. There has been a change in situation now and again on the part of those who still are able to earn their bread; but there is hardly any new blood being infused into those industries.

The workmen in times past have carefully abstained from teaching youths, and this is the result—the evil grows with that it feeds on. As the men become scarce so the masters are less able to assert the authority which rightly attaches to their position. And there are few operatives who are patriotic enough to instruct boys. Much of this is the result of unionism; some of it is the result of past low wages. Higher remuneration would remove the difficulty in only a few branches.

Meantime, the reader will observe the effect upon prices which must inevitably proceed from this state of things. What other issue could be looked for when we have advertisements for such men as smiths accompanied with appeals like this: "Wages no consideration to a competent man;" and when, as within our own knowledge, employers of artisans not more than usually clever with the file, and the hammer, and the drill, feel themselves so incapable of increasing their staff that, in order to provide against the loss which begins immediately to accrue upon the death of each workman, they have actually taken life interests in the men's existence!

We have pointed to one means whereby perhaps a little of this difficulty may be remedied; but nothing very effective will be done until masters make it to the interest of their men to train apprentices. We must revert to the old apprenticeship system. If we do not go back to the seven years' period, then we must take a shorter. Under certain restrictions, the boy must be the apprentice of the man, and not so much that of the master; and the man must have an immediate pecuniary interest in the labor of the boy. The man will then be foremost to seek the needed youthful labor; and will be sure to find it. By these means new blood will be infused into industries, but not by any means to the immediate easing of the prices of the commodities produced. If this system is not found practicable, then manufacturers of hardware must have a school of industry, where, under practical teachers, youths, and, if you like, adults, may come as students under professors at college, and there be taught any of the handicrafts in which there are teachers. We have thought much upon the question, and we are convinced that, with the advancing power of the operative classes, it is only in this way the difficulties of which hardware manufacturers are every month more and more complaining will be overcome. Unless we can increase the supply of skilled manual labor in not a few of the metalliferous branches, ironmongers will have to abandon all expectations of further ease in prices; indeed, they must think themselves happy if the tendency of higher wages, which necessitated a late advance, is not productive of similar consequences at no distant date.—*Ironmonger.*

The Himrod Furnaces.

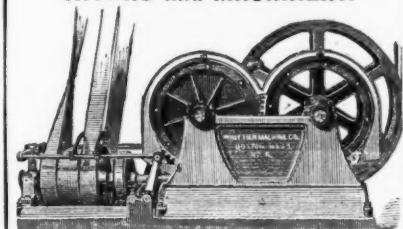
The Himrod Furnace Company, of Youngstown, Ohio, was organized and incorporated in 1859. The first furnace was completed and put in blast in the spring of 1860. Its dimensions were forty-five feet high and twelve feet bosh. This is known as furnace No. 1. It has since been rebuilt and enlarged until now it is forty-eight feet high and fourteen feet bosh, with bell or covered top. During the following year (1861) No. 2 furnace was erected with the same dimensions as No. 1. This furnace has also been rebuilt and enlarged to the present size of the first furnace. In 1868 the No. 3 furnace was erected. It was forty-eight feet high and thirteen feet bosh. Until a short time previous to the formation of this company only native ore had been used in the furnaces of the valley, but this company determined upon the experiment of using Lake Superior ore. Under the wise and efficient management of Mr. David Himrod the enterprise was a success from the outset. The first furnace turned out some twenty tons of iron per day, while previous to this time one hundred tons per week of iron of an inferior quality was deemed a remarkable yield for one furnace. To the Himrod Furnace Company belongs the credit of establishing the system of paying employees in cash. Before this time the various companies in the valley were accustomed to pay workmen with orders on stores, or scrip, but this company determined to inaugurate the payment of wages in money each month—the only true policy and the one now universally adopted. This company has from the first been eminently successful and prosperous. Its business reputation has been and is unrivaled. The officers of the company have invariably been men whose personal character alone was a sufficient guarantee to the public of its integrity and honor. None of the original stockholders are now living, except Mr. Himrod, and has retired from the company. Its pres-

ent officers are: president, R. A. Wight, of New York; treasurer and financial manager, A. B. Cornell of Youngstown; secretary, Robert Kelley, of New York. This company, together with Brown, Bonnell & Co., form the Mahoning Coal Company, and they therefore mine their own coal. About one hundred and fifty tons per day is consumed at the furnaces. Some sixty tons of pig iron is the average daily yield of these works, amounting to about 15,000 tons annually, worth in market, at \$30 per ton, \$450,000, which is the yearly business of the company here. The Himrod Furnace Company own some twenty-two acres of land situated west of Crab Creek, between the A. & G. W. and the A. Y. & P. R. R., and is occupied by the works of the company, switchers, &c. At present but two of the furnaces are in blast. A large horizontal engine drives the bellows of No. 1 furnace. This engine has a 32½ inch cylinder, with six feet stroke, one of the best engines in the valley. No. 2 and 3 furnaces have each upright engines with 30 inch cylinders and 4 feet stroke. Two of the furnaces have Pollock hot blasts and one the Hamilton hot blast. One A. S. Cameron steam pump supplies the water lifts and what is needed for the tuyeres and about the works. A cast is made at each furnace once in eight hours. We are informed that 6 tons of coal, 4½ tons of Lake Superior ore, and 1½ tons of limestone used at these furnaces will produce three tons of pig iron. This proportion varies with the purity of the ore, quality of the coal, &c. The air before being blown into the furnaces is heated to about 1000° Fahrenheit, and it requires more pounds of hot air to make a ton of pig metal than of coal, ore and limestone combined. The products of these furnaces are nearly all consumed within the radius of one hundred miles. They are shipped to Pittsburgh and Cleveland, and sold to supply the iron manufacturers of the valley.

In the Centennial exhibition buildings at Philadelphia, 11,000,000 pounds of iron will be used, and there will be 175,000 square feet of glass needed. The flooring of the memorial building will be marble tile, and will require 75,000 square feet. The cost of the permanent Centennial building is to be \$1,190,273.

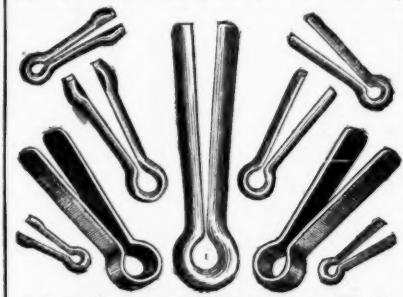
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This Company has just received the highest award, a Gold Medal, for Safety Elevators, from the Massachusetts Charitable Mechanics Association.

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Copal Varnishes
AND JAPANS.

To Coach Makers, Hardware Manufacturers, Car Builders, And the Trade generally using

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Aware of the impracticability of importing these articles at a price sufficiently clear for use here, we take pleasure in announcing that by our extensive experience in England, Canada and the United States, we are enabled to supply an article which, upon trial, will demonstrate its being EQUAL TO ANY English article, and unexcelled by any made in America, for its quick drying quality, as well as for its being durable and brilliant in color.

BRUNSWICK BLACK,
(Self Drying.)

No. 1, \$1.50 per gal. No. 2, \$1.25 per gal.

The London Mfg. Co.,

In submitting the

DAZZLE BLACK BAKING JAPAN

(And their Japans generally)

will call the attention of Sewing Machine Companies, Lock Manufacturers, Japanners and other manufacturers of hardware to this article, as it is peculiar to both as a preparing and finishing Japans. For the fine work of Sewing Machine Companies, Safe makers, and ornamental work of all description the **Dazzle Black Japans** are highly desirable, both as an Iron and Steel Japans.

These Baking and Self Drying Japans contain No coal tar, coal gas, nor deleterious substance, but are made from pure and unadulterated gums.

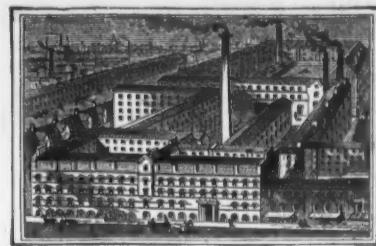
HYATT & CO.,

Proprietors.

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Factory, Newark, N. J.

113 Chestnut St.



Manufactury of the Spencerian Steel Pens, Birmingham, England.

Spencerian Double Elastic STEEL PENS.

The superiority and excellence of these justly celebrated Pens are appreciated, and is shown in their constantly increasing sales. The arm comprised in 15 numbers, of which one number alone has an annual sale of

5,000,000.

The **Spencerian Pens** are manufactured of the very best material by the most expert workmen in Europe, and are famous for their elasticity, durability and evenness of point.

The Spencerian Pens are For Sale by all Dealers.

We make Fifteen Numbers of Pens, differing in flexibility and fineness of point, adapted to every style of writing, as follows:

No. 1. Color Pen. *Point Fine; Action Perfect.* This is a great favorite with our leading penmen, is largely used in the Schools and Commercial Colleges throughout the country, and gives better satisfaction than any Pen before the American Public.

No. 2. Color Pen. *Point Fine and Flexible.* Well adapted to the use of Correspondents and Accountants.

No. 3. Commercial Pen. *Point Medium, An Easy Writing Pen.*

No. 4. Ladies' Extra Pen. *Point Extra Fine and Flexible.* For delicate fine hand writing this is a very superior Pen.

No. 5. School Pen. *Point Fine, Medium in Flexibility.* For a durable School Pen it has never been equaled.

No. 6. Flourishing Pen. *Point Long and Flexible.* For off-hand flourishing.

No. 7. Custom-House Pen. *Point Medium, Quick Action.*

No. 8. University Pen. *Point Medium, very supple, and flexible.* The action of this celebrated Pen is very fine.

No. 9. Bank Pen. *Point Long and Flexible.* A great favorite with Accountants, Clerks, &c.

No. 10. Custom-House Pen. *Point Medium.* Well adapted to all styles of bold Free-Hand Writing.

No. 11. University Pen. *Point Medium, very supple, and flexible.* The action of this celebrated Pen is very fine.

No. 12. Epistolaire Pen. *Point very Fine, and very Flexible.* This is the finest Pointed Pen made, and for very delicate writing, Map and Fine Pen.

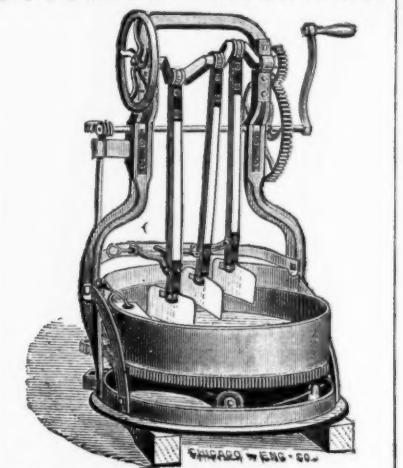
No. 13. Engraving Pen. *Point Blunt and Smooth, Particularly adapted to Coarse-hand Writing and Engraving.*

No. 14. Artistic Pen. *Flexible, with extra fine Point.* This exquisite and truly celebrated Pen is the best Pen extant for fine ornamental writing.

No. 15. The Queen. *Point extra fine.* Admirably adapted to all styles of Free-Hand Writing.

No. 16. Safety Cards containing all the FIFTEEN Numbers, securely encased, will be sent by mail on receipt of 25 cents.

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DRAW-CUT BUTCHERS' MACHINES.**SAUSAGE CHOPPERS AND STUFFERS.****LARD PRESSES.**

First premium medal in 1874, at New York, Boston and Cincinnati. For Sale to the Hardware Trade.

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**REVOLVING SCRAPER COMPANY,**

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Manufacturers of Doty's Revolving Road Scrapers, Mammoth Road Scrapers, H. H. and Canal Scrapers, with Pat. Wheels. Send for Circular and Price List.

Jewett's Patent Filter with PORCELAIN LINED COOLER.

Acknowledged the only

Complete Filter and Cooler

in the world.

Hardware, House-furnishing and Crockery dealers can find no more salable article, as this Filter is perfect in its work of purifying water of every kind, attractive in appearance, &c., &c.

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MANUFACTURED ONLY BY

JOHN C. JEWETT & SONS, Buffalo, N. Y.

NEW MODEL DERINGER REVOLVER.**22 Cal. 7 Shot.****An exact model of S. & W. No. 1 Revolver.**

This arm is Half Nickel Plated, and is equal in style to the best arms in the country. Quality of workmanship and material first-class, and guaranteed in every respect.

Price less than any other Hinge Barrel Cartridge Revolver in the market.

Sole Agents, EDWARD K. TRYON, Jr. & CO., General Dealers, No. 19 North Sixth Street and No. 220 North Second Street, PHILADELPHIA.

PORTABLE PIPE AND BOLT Threader and Cutter

Cuts off and threads from $\frac{1}{4}$ inch to 3 inch Pipes and Bars. Also taps Nuts and Dies furnished with machine. No Pipe splitting; no bevels inside or out. Requires no skilled labor.

A Full Set of Sockets and Lengths for Making Nipples Furnished with each Machine.

ANY SOLID DIE CAN BE USED IN THIS MACHINE.

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EMPIRE MFG. CO., 18 William Street, N. Y.**CENTENNIAL SELF-LUBRICATIVE Hemp Piston Packing**

FOR Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,
SOLE MANUFACTURERS,
Office, 1321 Fairmount Ave., Phila.
PATENT APPLIED FOR.

Send for Circular.

WM. RESOR & CO., Cincinnati,

Manufacturers of the



FASHION for Wood.
With or without Iron Clad, Copper Low Reservoir, and the celebrated MONITOR Coal and Wood Cook.

MICHIGAN STOVE CO.,
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Manufacturers of

COOKING, PARLOR AND HEATING STOVES.

Made from the Best Brands of Lake Superior Charcoal and other First Class Brands of Iron.

Also Manufacture for the Western Trade.

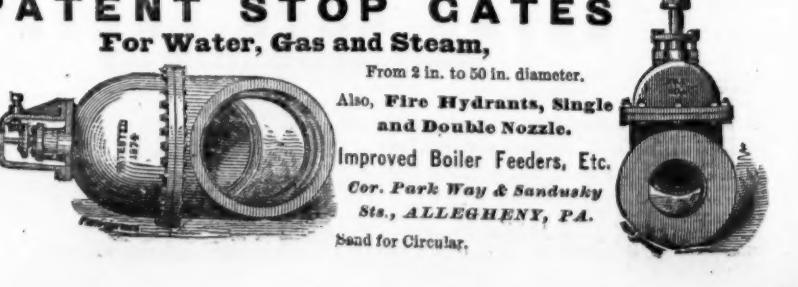
The Prince of Base Burners, THE ARGAND.

J. R. HUTCHINSON & CO.,
Manufacturers of**PATENT STOP GATES**

For Water, Gas and Steam.

From 2 in. to 50 in. diameter.
Also, Fire Hydrants, Single and Double Nozzle.
Improved Boiler Feeders, Etc.
Cor. Park Way & Sandusky Sts., ALLEGHENY, PA.

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Keystone Saw, Tool, Steel and File Works,

Front and Laurel Streets, Philadelphia.

MANUFACTURERS OF

SAWS OF EVERY DESCRIPTION, FILES, &c.

Also Sheet Steel and Articles made from Sheet Steel.

Branch Works, Tacony, Philadelphia.

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HENRY DISSTON & SONS desire to call the attention of the Hardware Trade, also the Mechanics of this Country, to their



“NEW PATENT SKEW BACK HAND SAW,”

which has been pronounced by all first-class workmen who have used it, to be eminently superior in every respect to the old style hand saw. Its advantages are manifold, the peculiar formation of the blade actually stiffening and strengthening it in a remarkable degree, and the recess in the handle allowing the introduction of the thumb of the left hand and giving the operator full power to manipulate the saw, and the principle of bedding the handle in the blade bringing the operator closer to his work, an advantage will be readily appreciated by any mechanic. It is a singular fact that while vast improvements are constantly being made in all other kinds of saws, the hand saw of to-day in shape and style is similar to the hand saw of centuries ago. Recent experience has proved that it is as susceptible of improvement as any other saw. Our aim and object has ever been to assist the mechanic and lighten his toil, and one trial of our **NEW PATENT SKEW BACK HAND SAW** will prove how well we have succeeded.

New York Wholesale Prices, November 25, 1874.

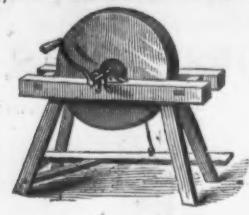
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| Wheel Barrows. | dis 25 % | Tea Pot Handles—P. S. & W. | dis 20 % | Chrome Steel. | W. B. 20 @ 21c |
| Puseley & Chapman. | per doz \$3 50 net | Stow's Patent Hollow Tea Pot Handles. | per gross, \$11 50 | Tool, extra flat. | W. B. 20 @ 21c |
| Bronze. | per doz \$3 50 net | 1 1/2 inches. | per gross, \$11 50 | Spring. | W. B. 12c and upward |
| Well Wheels. | dis 10 % | 2, Medium, 5 1/2 | 12c | Machinery. | W. B. 14c. |
| Revised list. | | 3, Large, 6 1/2 | 13c | Hammer. | W. B. 15c. |
| Wire. | | 4, Ex. Large 7 1/4 in., for Wash Pitchers. | 14c | Gun or Homogeneous. | W. B. 16c. |
| Brass and Copper. | Nos. 9 to 18 dis 40 @ 45 % | 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 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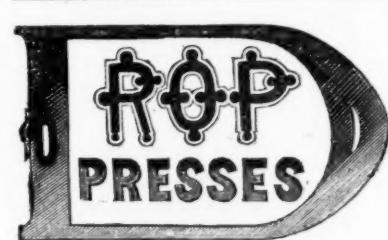
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Bennett Hotchkiss and
N. C. Stiles' Patent.

This Drop (which has been illustrated in this journal) is of that class, where the board is raised by a stiff
belt, and passes up between two friction rolls, and
is so well known that we will only describe our improve-
ments. The patents we are working under are those of
BENNETT HOTCHKISS (who in an interference case with
Goulding & Stiles, was the first inventor) and
N. C. STILES. Our improvements consist of:

First.—Of an arrangement of parts that makes it the
most complete Jobbing Hammer, and will take the place
of a great many other tools. *Second.*—A foot lever, ad-
ditional to the upright rod, which is operated by the
hammer to open and close the rolls, we place another rod
the lower end of which is secured to the end of a lever
which is operated by the foot, and which opens and
closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not
disturb the hand lever, thereby preventing the hand
being hit or jarred.

Second.—No dog is used on the upright to hold up the
hammer. The belt or board passes up between two
clamps situated under the rolls, so arranged that as the
hammer ascends it will freely open the clamps, but
as it descends they will close and hold up the hammer.
To let the hammer fall the clamps are opened by pres-
sure upon the foot treadle.

Third.—The board or belt is secured to the hammer by
an elastic connection which prevents the sudden jar and
destruction of the same. The back roll is made adjustable
to different thicknesses of board or belt, as also are
the clamps. An adjustable collar on the upright rod ad-
mits of a selected size of blow, and is adjusted automatically.
If one blow is wanted, press upon the
treadle and remove the pressure as soon as the blow is
given. Keep the foot upon the treadle, and the blow
will be repeated as often as required. If a long
blow of the right height the collar is set for it required,
work the hand lever, which will give you any height of
blow desired. The hammer can be held up at any point
of the blow by holding the foot upon the treadle, and when
the hammer is at the desired height, so that the
next blow can be given from a state of rest, of less height
than the collar is set for. This is a feature no other drop
has. *Fourth.*—The great belt struck can rest on a
soft, smooth or hard, and is not strained from a state of
rest. A gentle pressure upon the treadle will allow the
hammer to go down slowly, but it will stop and remain
suspended at any point as soon as the pressure is re-
moved.

The clamps in holding up the hammer, keep the board
from touching either roll and prevent the same from
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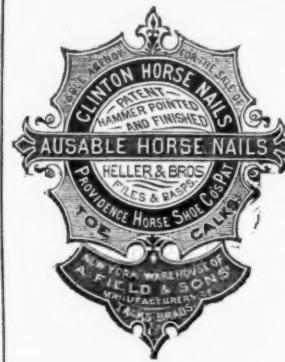
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full size of the larger part of the so called
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making the jaw fully equal to any strain
the bar may be subjected to.

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up flush, against square, solid bearings (that
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our claim that we are manufacturing the
strongest Wrench in the market.

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that in 1869 we made several important im-
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wrench previously manufactured by L. & A.
G. Coes, which were at once closely imitated
and sold as the *Genuine Wrench* by certain par-
ties who seem to rely upon our improvements
to keep up their reputation as manufacturers,
and although the fact of their imitating our
goods may be good evidence that we manu-
facture a superior Wrench, we wish the trade may
not be deceived on the question of originality.
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recent efforts, both in improvements on the
Wrench and in the adoption of a Trade Mark,
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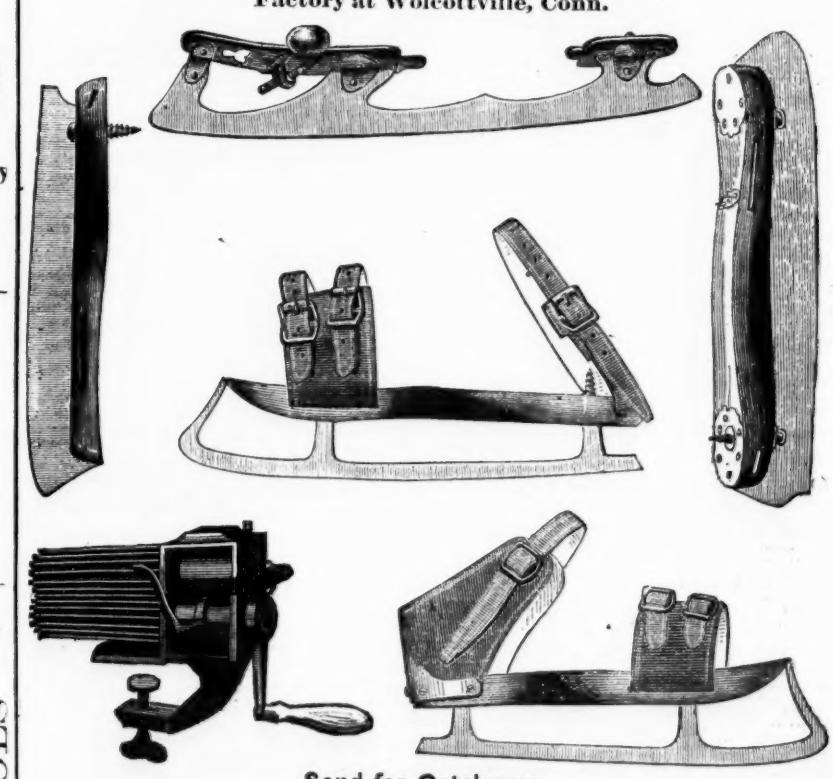
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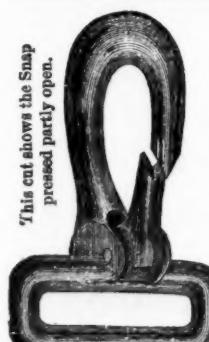
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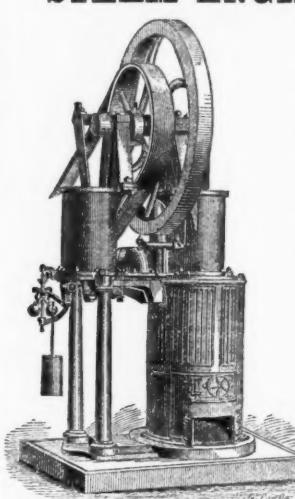
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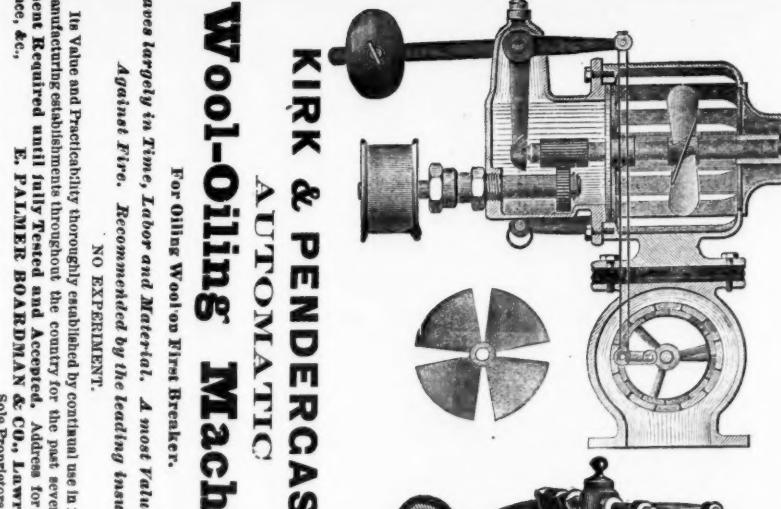
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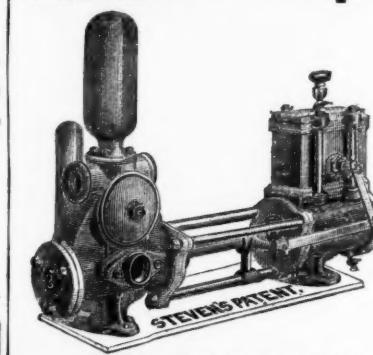
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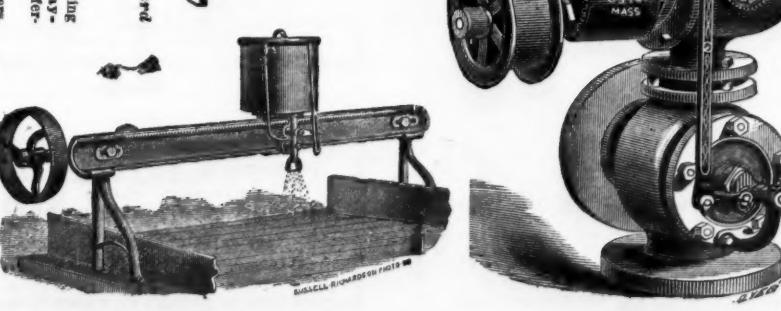
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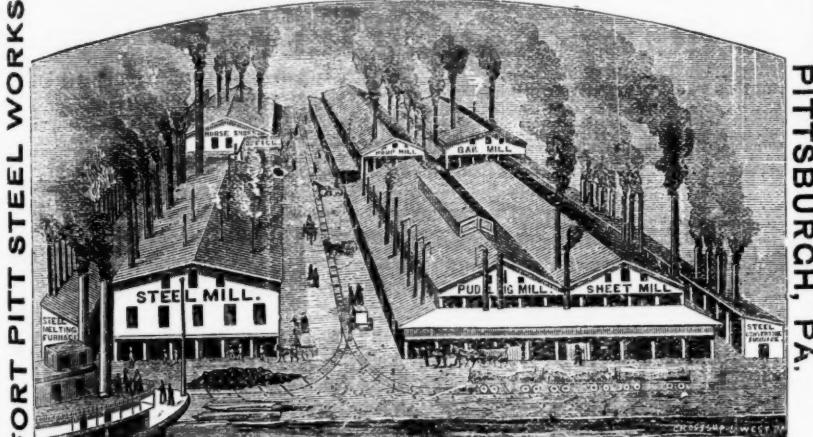
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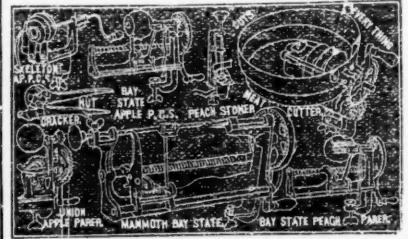


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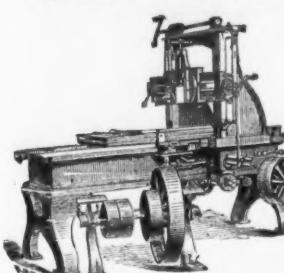
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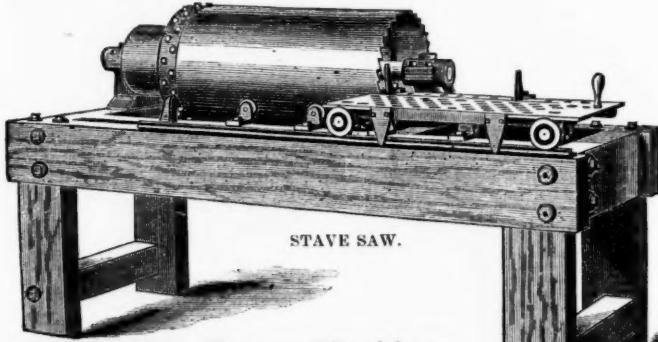
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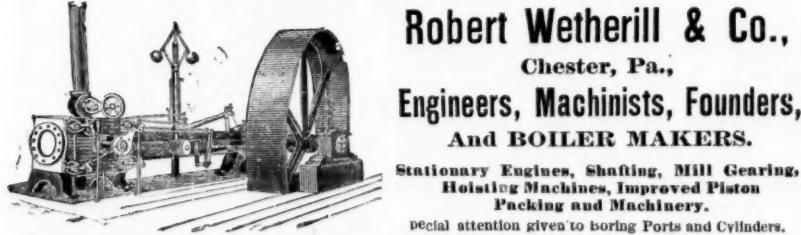
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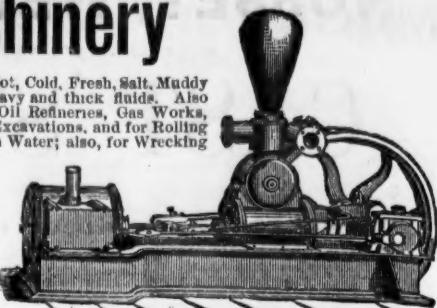
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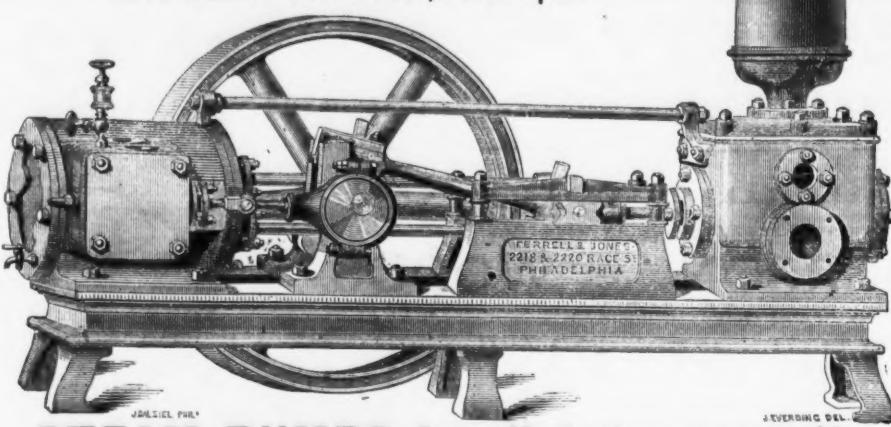
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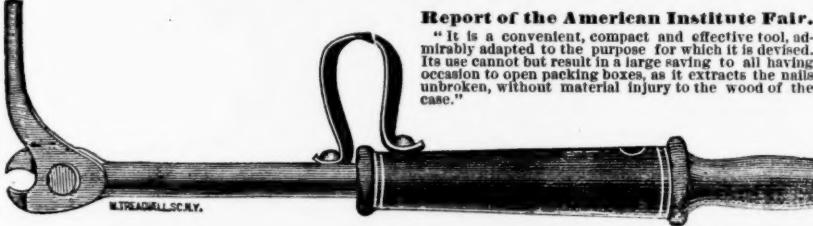
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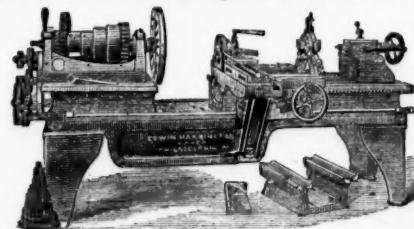
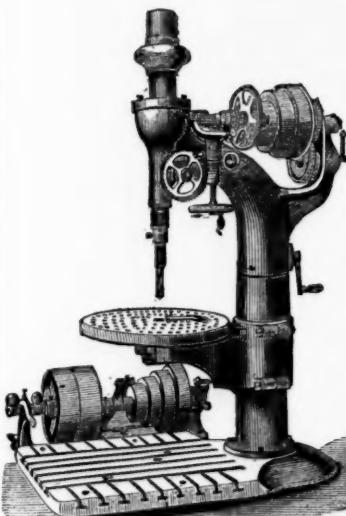
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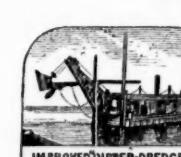
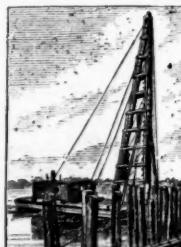
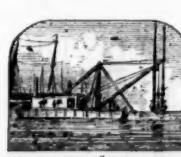
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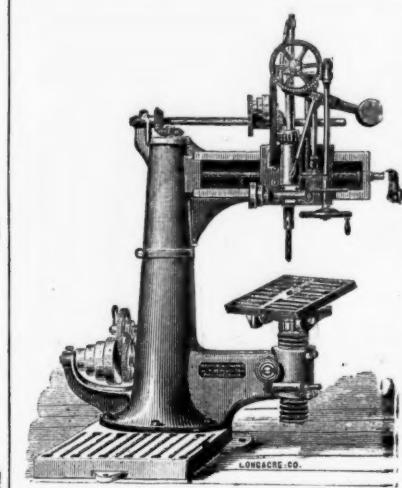
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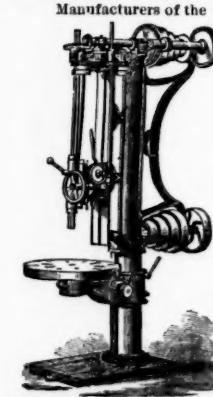
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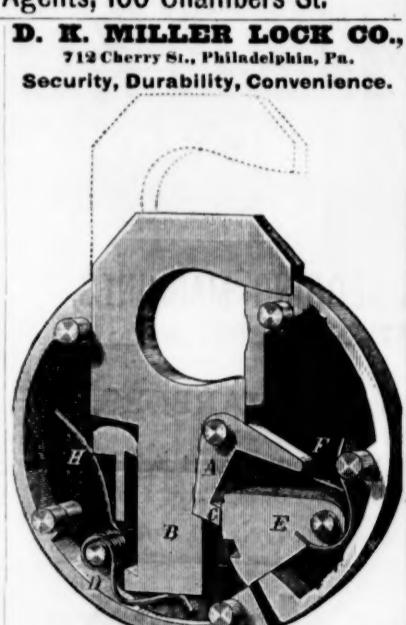
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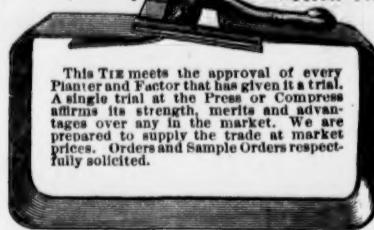


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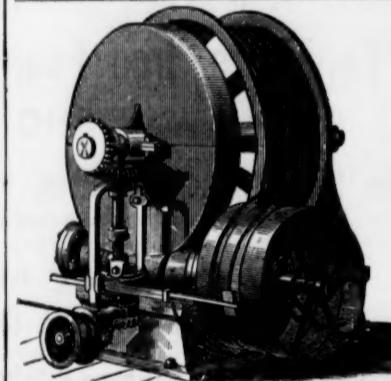
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